CLUSTER I

CONCEPTUAL FRAMEWORK

CHAPTER 1

Topic:

EFFECT OF AUDIO ANIMATION INSTRUCTURAL MEDIA ON MIDDLE BASIC EDUCATION PUPILS' ACHIEVEMENT AND INTEREST IN ENGLISH LANGUAGE IN AGBANI EDUCATION ZONE

Presented below are practical examples of conceptual review derived from major variables of this study.

Teaching and Learning of English language

English language is one of the world's commonly used languages. Historically, English language originated from England. George (2016) averred that English language is a West Germanic language of the Indo-European language family that is closely related to the Frisian, German, and Dutch (in Belgium called Flemish) languages. English language is the language of the United Kingdom and the dominant language of the United States of America, Canada, Australia, Ireland, New Zealand and various island nations in the Caribbean Sea and the Pacific Ocean, (Julius, 2015). Julius further stated that English language is also an official language of India, the Philippines, Singapore, and many countries in sub-Saharan Africa, including South Africa and Nigeria. Natshi (2016) hinted that English language is the first choice of foreign languages in most other countries of the world, and it is that status that has given it the position of a global lingua franca. As a member of the Indo-European family of languages, English language is related to most other language spoken in Europe and western Asia from Iceland to India. This fact may have informed the claim of Natshi (2016) who estimated that a third of the world's population speak and use English language. In Nigeria, English language serves as the national language, that is, official language or lingua franca.

It also serves as the language of instruction across all levels of the Nigerian educational system beginning from Middle Basic Education Level. Specifically, the use of English language as language of instruction starts from Middle Basic Education I (Primary 4). At this level, English language is taught as a subject and also used to teach all other subjects.

Teaching and learning of English language therefore is a very important issue in the Nigerian Middle Basic Education sector. Teaching and learning of English language no doubt, is both exciting and tasking. Buckie (2016) enumerated broad topics that characterize the teaching and learning of modern English language in schools. Included in Buckie's list were phonology, morphology, composition, syntax and orthography. Phonology refers to the study of the way sounds function in English language, including phonemes, syllable structure, stress, accent, intonation and which sounds are distinctive units within the language. In English language, phonology refers to the way sound function within the language. According to Ferdinand (2017) phonology at Basic Education level has to do with pronunciation and listening. Ferdinand defined pronunciation as the standard way in which a word is made to sound when spoken. While listening refers to paying attention to a sound, or taking note of, hearing, harkening or giving ear to sounds.

Evidently, pronunciation and listening are major components of teaching and learning of languages in general and English language in particular. Interestingly, pronunciation and listening are among the literacy topics treated in this study. El-Amin (2017) recommended that English language teachers at primary school level should emphasize pronunciation and listening skills because the two can hardly be separated. El-Amin argued that while pronunciation skills aid spoken English in standard sounds, listening skills must be in place so that learners can hear, harken, heed and pay attention to the sounds the teacher makes while pronouncing. This justifies the focus of this study on literacy topics such as pronunciation skills and listening skills. Agada (2018) described English language morphology as the study of the internal structure of morphemes (words and their semantic building blocks) in English

language. Agada averred that teaching and learning of English language morphology can enhance Basic Education pupils' writing skills. Agada further submitted that good competencies in understanding English words and their semantic building blocks will facilitate good performance in teaching and learning of English language composition.

Teaching composition in English language according to Nnamani (2018) intells teaching the learners the art of formation of compound words from separate words or simply put, the art of essay writing. In composition, the learners are taught to construct, constitute or makeup the whole by merging parts (component words) in a meaningful way. Nnamani observed that at Middle Basic Education level, the pupils are taught composition by giving them hints. These hints could be questions such as What is your father's name, How old is your father, Where does your father hail from (his Town, Local Government Area, State and Nationality), Describe your father's complexion, his height, his occupation, his religious affiliation and his hobbies. With these, a pupil can articulate a meaningful write up about his father. Closely related to composition is syntax. According to Dante (2019), syntax is a set of rules that govern how words are combined to form phrases and sentences. According to Dante, syntax may be defined as the study of the structure of phrases, clauses and sentences in a language. Dante observed that composition and syntax when taught effectively can improve the writing skills of Basic Education pupils.

English language Orthography is the aspect of teaching and learning of English language concerned with letters and their sentences in words. Derbuck (2014) defined orthography as the study of correct spelling according to established usage. Derbuck described spelling as the method of representing a language or the sounds of a language by written symbols. Orthography (spelling) is very useful for writing. This is because a word may convey a different meaning when mis-spelt. Conclusively, Kennedy (2019) posited that teaching and learning of English language will be unproductive without appropriate reading skills. Kennedy described reading as talking or speaking aloud words or other information that is written. Reading must be done in a way to help the listener

interpret correctly or infer a meaning or significance from the text being read. Reading skill interestingly was treated in this study. As shown above, all these broad topics that characterize the teaching and learning of modern English language in schools are related to the literacy topics selected for this study. From the foregoings, teaching and learning of English language in contemporary time starts from teaching and learning of literacy.

Teaching and Learning of Literacy

In every nation in the world, education is considered as the fundamental element for National Development. Julius (2015) explained that educating the mind amounts to inculcating orderliness and capabilities for the utilization of human and natural resources for the betterment of the society. No doubt, literacy which commonly refers to the ability to read and write, is very vital in the education process. Hassan (2014) defined literacy as: "The ability to read, write and use numeracy, to handle information, to express ideas and opinions, to make decisions and solve problems, as family members, workers, citizens and lifelong learners. Ferdinand (2017) described Literacy Education as the process of transferring or teaching individuals, a group of people how to read, write and use literacy to handle information, to express ideas and opinions, to make decisions and solve problems, etc, under strict supervision and guidance of others such as a teacher, instructors or anybody with authority to educate others. Literacy education, that is, teaching and learning of literacy, is therefore, to a large extent, a predictor of progress across the entire formal education levels.

Literacy education (teaching and learning of literacy) plays important role in elimination of illiteracy which limits the attainment of sustainable human development. Illiteracy negatively affects labor force, economy and social wellbeing of the society. According to Imuno (2015), in this contemporary age, an illiterate person is considered to be circumscribed and hence incapacitated from playing his/her potential roles in the socio-political, economic and national development. An illiterate individual tends to live a marginal life and is vulnerable to exploitation by others. Olayinka (2015) observed that the

high illiteracy rate in Nigeria today can be seen as one major factor responsible for slowing down national development. A nation cannot achieve sustainable development without good governance, strong economy and good education. It is a known fact that no nation can rise above the quality of its educated citizenry. Literacy Education aims at developing the individual who in turn is expected to contribute to the development of the society. When an individual is developed, by extension, the nation is developed. A major characteristics of literacy education is its emphasis on development. Baraje (2015) identified a positive correlation between quality of literacy and level of development.

The importance of teachers and the role they play in teaching and learning of literacy are, unarguably, central to basic education. Literacy according to Natshi (2016) refers to the ability to possess the basic skills of reading, writing and numerical computation for effective participation in the affairs of the society .Natshi averred that the teaching and learning of literacy involves the process of transferring the basic skills of literacy from a teacher to a learner or learners under supervision and guidance. Literacy is a fundamental human right and the foundation for lifelong learning. Akpan (2014) stated that literacy is fully essential to social and human development in its ability to transform lives. For individuals, families, and societies alike, literacy is an instrument of empowerment to improve one's health, one's income, and one's relationship with the world. The uses of literacy for the exchange of knowledge according to Akpan are constantly evolving, along with advances in technology. consequently, the teaching and learning of literacy must respond to technological advancements.

Simply put, teaching and learning of literacy must embrace the newest technologies that have the capacities to promote and enhance learners' achievement and interest in literacy. Justice (2017) maintained that computer-aided instruction such as audio animation instructional media are very voguish and have all it takes to promote and enhance today's learners achievement and interest in literacy. Literacy avails the literate individual a wider opportunity for business, social, intellectual, cultural, religious and political participations. A literate community is a dynamic community which

enhances National Development, one that exchanges ideas and engages in debate. Illiteracy, however, is an obstacle to a better quality of life, and can even breed exclusion and violence, (Derbuck, 2014). According to Derbuck, for over 65 years the United Nations Educational Scientific and Cultural Organization (UNESCO) has worked to ensure that teaching and learning of literacy remains a priority on national and international agenda as a catalyst for National Development.

Through its formal and non-formal literacy programmes worldwide, UNESCO works to realize the vision of a literate world for all. Obviously, this is in recognition of the importance of literacy to the whole world. Wale (2016) posited that literacy helps provide a basis on which people may come together and thoughtfully make decisions which enhances adaptability and National development. El-Amin (2017) noted that in a society where the adults are ill-informed, poor and diseases- ridden, dependent and crippled by illiteracy, the future of their children who themselves are future adults become precarious and susceptible to inheriting all the ills and damages accompanying illiteracy. Nnamani (2018) averred that the primary purposes of teaching and learning of literacy at basic education level in Nigeria are to enhance basic communication skills and elementary numeracy (arithmetic computations). Consequently, basic education literacy is taught as a component of basic education English language and as a component of basic education mathematics. As a component of basic education English language, Middle Basic Educaiton literacy focuses on the following basic communication skills; listening skills, pronunciation skills, reading skills and writing skills. These topics of literacy formed the focus of this study.

Audio Animations

According to Kim, Jex and Mogul (2012), animation is the rapid display of a sequence of images of two dimensional (2-D) or three dimensional (3-D) artwork or model positioned to create an illusion of movement. The effect is an optical illusion of motion due to the phenomenon of persistence of vision, and can be created and demonstrated in several ways. The most common method of

presenting animation is as a motion picture or video program, although there are other methods. AL-Amin and Husseni (2012) defined animation as the techniques of filming successive drawings or positions of model figures, to create a film giving an illusion of movement. The word animation derives from latin "'animatio" meaning "the act of bringing to life" from "animo" ("to animate" or "give life to") "atio" ("the act of").

According to Ngoma (2013), early examples of attempts to capture the phenomenon of motion drawing can be found in Paleolithic cave paintings, where animals are depicted with multiple legs in super imposed positions, clearly attempting to convey the perception of motion. Historically, a 5,000 year old earthen bowl found in Iran in Shahr-I Sokhta has five images of a goat painted along the sides. This has been claimed to be an example of early animation. However, since no equipment existed to show the image in motion, such a series of images cannot be called animation in a true sense of the word. (AL-GAZIR 2013). Michelle (2012) reported that a Chinese zoetrope-type device had been invented in 180 AD. The phenakistoscope, praxinoscope, and the common flip book were early popular animation devices invented during the 19th century. These devices produced the appearance of movement from sequential drawings using technological means, but animation did not really develop much further until the advent of cinematography. There is no single person who can be considered the "creator" of film animation, as there were several people working on projects which could be considered animation at about the same time.

According to Mbunda (2012), George Melies was creator of special-effect films; melies was generally one of the first people to use animation with his technique. Melies discovered a technique by accident which was to stop the camera rolling to change something in the scene, and then continue rolling the film. This idea was later known as stop-motion animation. Melies discovered this technique accidentally when his camera broke down while shooting a bus driving by. When he had fixed the camera, a hearse happened to be passing by just as Melies restarted rolling the film, his end result was that he had managed to make a bus transform into a hearse. This was just one of the contributors to animation in the early years. Mbunda

(2012) also asserted that the earliest surviving stop-motion advertising film was an English short by Arthur Melbourne-Cooper called Matches: (An Appeal 1989), Developed for the Bryant and May Matchsticks company, it involved stop-motion animation of wired-together matches writing a patriotic call to action on a blackboard.

Hook and Charles (2012) stated that J. Stuart Blackton was possibly the first American film-maker to use the techniques of stop-motion and hand-drawn animation. Introduced to film-making by Edison, Blackton pioneered these concepts at the turn of the 20th century, with his first copyrighted work dated 1900. Several of his films, the Enchanted Drawing (1900) and Humorous Phases of Funny Faces (1906) were film versions of Blackton's "lightening artist" routine, and utilized modified versions of Melies early stop-motion techniques to make a series of blackboard drawing appear to move and reshape themselves, "Humorous Phases of Funny Faces' is regularly cited as the first true animated film, and Blackton is considered the first true animator. Zacky and Yound (2013) narrated that a French artist, Emile Cohl, began drawing cartoon strips and created a film in 1908 called Fantasmagorie.

The film largely consisted of a stick figure moving about and encountering all manner of morphing objects, such as a wine bottle that transforms into a flower. There were also sections of live action where the animator's hands would enter the scene. The film was created by drawing each frame on paper and then shooting each frame onto negative film, which gave the picture a blackboard look. This makes Fantasmagorie the first animated film created using what came to be known as traditional (hand-drawn) animation.

According to Marcellio and Haroldei (2011), following the successes of Blackton and Cohl, many other artists began experimenting with animation. One such artist was Winsor McCay, a successful newspaper cartoonist, who created detailed animations that required a team of artists and painstaking attention for detail. Each frame was drawn on paper; which invariably required backgrounds and characters to be redrawn and animated. Among McCay's most noted films are Little Nemo (1911), Certie the Dinosaur (1914) and the Sinking of the Lusitania (1981). The

production of animated shot films, typically referred to as "cartoons", became an industry of its own during the 1910s, and cartoon shorts were produced to be shown in movie theaters. The most successful early animation producer was John Randolph Bray, who, along with animator Earl Hurd, patented the cel animation process which dominated the animation industry for the rest of the decade. El Apostle (Spanish: "The Apostle") was a 1917 Argentine animated film utilizing cutout animation, and the world's first animated feature film.

Traditional animation (also called cel animation or hand-drawn animation) was the process used for most animated films of the 20th century. The individual frames of a traditionally animated film are photographs of drawings, which are first drawn on paper. To create the illusion of movement, each drawing differs slightly from the one before it. The animators' drawings are traced or photocopied onto transparent acetate sheets called cels, which are filled in with paints in assigned colors or tones on the side opposite the line drawings. The completed character cels are photographed one-by-one onto motion picture film against a painted background by a rostrum camera.

The traditional cel animation process became obsolete by the beginning of the 21st century. Today, animators' drawings and the backgrounds are either scanned into or drawn directly into a computer system. Various software programs are used to color the drawings and simulate camera movement and effects. The final animated piece is output to one of several delivery media, including traditional 35mm film and newer media such as digital video. The "look" of traditional cel animation is still preserved, and the character animators' work has remained essentially the same over the past 70 years. Some animation producers have used the term "tradigital" to describe cel animation which makes extensive use of computer technology, (Terry, 2011). Example of traditionally animated feature films include Pinocchio (United States, 1940), Animal Farm (United Kingdom, 1954), and Akira (Japan, 1988). Traditional animated films which were produced with the aid of computer technology include the Lion King (US, 1994) Sen to

Chihiro no Kamikakushi (Spirited away) (Japan, 2001), and Les Triplettes de Belleville (France, 2003).

Mayo (2011) distinguished between full and limited animation as follows; Full Animation refers to the process of producing high-quality traditionally animated films, which regularly use detailed drawings and plausible movement. Fully animated films can be done in a variety of styles, from more realistically animated works such as those produced by the Walt Disney studio. Many of the Disney animated features are examples of full animation, as are non-Disney works such as The Secret of NIMH (US, 1982), the Iron Giant (US, 1999), and Nocturna (Spain, 2007). Limited Animation involves the use of less detailed and/or more stylized drawings and methods of movement. Pioneered by the artists at the American studio United Productions of America, limited animation can be used as a method of stylized artistic expression, as in Gerald McBoing Boing (US, 1951), Yellow Submarine (UK, 1968), and much photo realistic animation, is used primarily for animation that attempts to resemble real life. Using advance rendering that makes detailed skin, plants water, fire, clouds, etc. to mimic real life. Examples include Up (2009, USA), Kung-Fu Panda (2008, USA), Ice Age (2002, USA). 2-D animation techniques tend to focus on image manipulation while 3-D techniques usually build virtual worlds in which characters and objects move and interact. 3D animation can create images that seem real to the viewer. Mark (2011). Hiz (2012) listed the following Animation techniques;

Paint-on-glass animation: a technique for making animated films by manipulating slow drying oil paints on sheets of glass, for example by Aleksandr Petrov.

Erasure animation: is a technique using tradition 2-D medium, photographed over time as the artist manipulates the image. For example, William Kentridge is famous for his charcoal erasure films, and Piotr Dumala for his auteur technique of animating scratches on plaster.

Pin-screen animation: makes use of a screen filled with movable pins, which can be moved in or out by pressing an object onto the screen. The screen is lit from the side so that the pins cast shadows. The technique has been used to create animated films with a range of textural effects difficult to achieve with traditional cel animation.

In Sand animation: sand is moved around on a back- or front-lighted piece of glass to create each frame for an animated film. This creates an interesting effect when animated because of the light contrast.

Flip book: (Sometimes, especially in British English, called a flick book) is a book with a series of pictures that vary gradually from one page to the next, so that when the pages are turned rapidly, the pictures appear to animate by simulating motion or some other change. Flip books are often illustrated books for children, but may also be geared towards adults and employ a series of photographs rather than drawings. Flip books are not always separate books, but may appear as an added feature in ordinary books or magazines, often in the page corners. Software packages and websites are also available that convert digital video files into custom-made flip books.

Kim et al (2012) defined computer animation as the generation and manipulation of images by means of a computer to create moving images. Computer animation encompasses a variety of techniques, the unifying factor being that animation is created digitally in a computer. It takes less time than previous traditional animation. According to Mayo (2011) computer animation is the process used for generating animated images by using computer graphics. The more general term computer generated imagery encompasses both static scenes and dynamic images, while computer animation only refers to moving images.

Hiz (2012) narrated that some of the earliest animation done using a digital computer was done at Bell Telephone Laboratories in the first half of the 1960s by Edward E. Zajac, Frank W. Sinden, Kenneth C. Knowlton, and Michael Noll. Early digital animation according to Hiz, was also done at Lawrence Livermore Laboratory. Another early step in the history of computer animation was the

1973 movie West-world, a science-fiction film about a society in which robots live and work among humans, though the first use of 3D Wireframe imagery was in its sequel, Future World (1976), which featured a computer-generated hand and face created by then University of Utah graduate students Edwin Catmull and Fred Parke.

Hiz further held that developments in CGI technologies are reported each year at SIGGRAPH, an annual conference on computer graphics and interactive techniques, attended each year by tens of thousands of computer professionals. Developers of computer games and 3D video cards strive to achieve the same visual quality on personal computers in real-time as is possible for CGI films and animation. With the rapid advancement of real-time rendering quality, artists began to use game engines to render non-interactive movies. This art form is called machinima. The first feature-length computer animated film was the 1995 movie Toy Story by Pixar. It followed an adventure centered around some toys and their owners. The groundbreaking film was the first of many fully computer animated films. Computer animation helped make blockbuster films such as Toy Story 3 (2010), Avatar (2009), Shrek 2 (2004), and Cars 2 (2011)

According to Mark (2011) 2D animation figures are created and/or edited on the computer using 2D bitmap graphics or created and edited using 2D vector graphics. This includes automated computerized versions of traditional animation techniques such as of, interpolated morphing, onion skinning and interpolated rotoscoping. 2D animation has many applications, including analog computer animation, flash animation and Power-point animation. Cinemagraphs are still photographs in the form of an animated GIF file of which part is animated. Power point animations were mostly used in this study.

Michelle (2012) explained that 3D animation is digitally modeled and manipulated by an animator. To manipulate a mesh, it is given a digital skeletal structure that can be used to control the mesh. This process is called rigging. Various other techniques can be applied, such as mathematical function (eg. Gravity, particle simulations), simulated fur or hair, effects such as fire and water and

the use of motion capture to name but a few, these techniques fall under the category of 3D dynamics. Well-made 3D animations can be difficult to distinguish from live action and are commonly used as visual effects for recent movies. Toy Story (1995, USA) is the first feature-length film to be created and rendered entirely using 3D graphics. Michelle added that Cel-shaded animation, is used to mimic traditional animation using CG software. Shading looks stark, with less blending colors. Examples include, Skyland (2007, France), Appleseed Ex Machina (2007, Japan), The Legend of Zelda: Wind Waker (2002, Japan). Machinima, are films created by screen capturing in video games and virtual worlds. Motion capture, is used when live action actors wear special suits that allow computer to copy their movements in CG characters. Examples include Polar Express (2004, USA), Beowulf (2007, USA), A Christmas Carol (2009, USA), The Adventures of Tintin (2011, USA).

Modern computer animation usually uses 3D computer graphics, although 2-D computer graphics are still used for stylistic, low bandwidth, and faster real-time renderings. Sometimes the target of the animation is the computer itself, but sometimes the target is another medium, such as film, (Hiz, 2012).

Mark (2011) adduce that to create the illusion of movement, an image is displayed on the computer screen and repeatedly replaced by a new image that is similar to it, but advanced slightly in time (usually at a rate of 24 or 30 frames/second). This technique is identical to how the illusion of movement is achieved with television and motion pictures. For 3D animations, objects (models) are built on the computer monitor (modeled) and 3D figures are rigged with a virtual skeleton. For 2D figure animations, separate objects (illustrations) and separate transparent layers are used, with or without a virtual skeleton. Then the limbs, eyes, mouth, clothes, etc. of the figure are moved by the animator on key frames. The differences in appearance between key frames are automatically calculated by the computer in a process known as tweening or morphing. Finally, the animation is rendered.

For 3D animations, all frames must be rendered after modeling is complete. For 2D vector animations, the rendering process is the key frame illustration process, while tweened frames are rendered as needed. For pre-recorded presentations, the rendered frames are transferred to a different format or medium such as film or digital video. The frames may also be rendered in real time as they are presented to the end-user audience. Low bandwidth animations transmitted via the internet (e.g. 2D Flash, X3D) often use software on the end-users computer to render in real time as an alternative to streaming or pre-loaded high bandwidth animations.

Bell and Thompson (2012) demonstrated an example of computer animation as follows; the screen is blanked to a background color, such as black. Then, a goat is drawn on the right hand side of the screen. Next, the screen is blanked, but the goat is re-drawn or duplicated slightly to the left of its original position. This process is repeated, each time moving the goat a bit to the left. If this process is repeated fast enough, the goat will appear to move smoothly to the left. This basic procedure is used for all moving pictures in films and television. The moving goat is an example of shifting the location of an object. More complex transformations of object properties such as size, shape, lighting effects often require calculations and computer rendering instead of simple re-drawing or duplication.

Bell and Thompson explained that to trick the eye and brain into thinking they are seeing a smoothly moving object, the pictures should be drawn at around 12 frames per second (frame/s) or faster (a frame is one complete image). With rates above 70frames/s no improvement in realism or smoothness is perceivable due to the way the eye and brain process images. At rates below 12frame/s most people can detect jerkiness associated with the drawing of new images which detracts from the illusion of realistic movement. Conventional hand-drawn cartoon animation often uses 15frames/s in order to save on the number of drawings needed, but this is usually accepted because of the stylized nature of cartoons. Because it produces more realistic imagery, computer animation demands higher frame rates to reinforce this realism. Bell and Thompson further hinted that movie film seen in theaters in the United States

runs at 24 frames per second, which is sufficient to create the illusion of continuous movement. For high resolution, adapters are used. In the design of Audio Animation Instructional Media used in this study, attributes of both 2D and 3D animation techniques were utilized, though what was necessary for this study was the auditory attribute.

Charts

To ensure a high interest and academic performance of learners, the search for ways of making teaching and learning simpler becomes inevitable. At middle basic education level, one of the ways of ensuring higher interest and academic performance of pupils is to increase chances of visualization of concepts. No doubt, one of such ways is the use of charts in teaching and learning. Buckie (2016), defined a charts as a systematic non-narrative presentation of data. To George (2016) a chart is a sheet of information in the form of a table, graph, or diagram. Nuhu (2015), posited that a chart is a graphical representation the data visualization, in which data are represented by symbols, such as bars in a bar chart, lines in a line chart, slices in a pie chart or pictures in a pictograph. Summarily a chart is a sheet (of paper) or a cardboard on which diagrams or lists of figures that show information are presented. Charts may be used to display tabular numeric data, functions or some kinds of quality structure providing different information.

Unarguably, a common, effective teaching method is to use visual presentations in a classroom. Charts and diagrams are especially helpful, as they enable learners to see ideas visually laid out in an organized way. Also, visual tools can help the learners process content and to make connections more easily. Charts are especially useful in middle basic education classes, where pupils tend to have shorter attention spans. Posting charts or diagrams can help reinforce information that pupils are learning or have already learnt. Pixton (2011) suggested that charts should be Hong where learners can see them. Ideally, the chart should be at the learners ' eye level or just above eye level. Pixton also suggested the use charts that have clear images and large text. Pixton further suggested that

a teacher can keep charts that have information he would use throughout the year on display so the learners can refer to them when they need to. For example, the literacy teacher can keep a chart about the rules of punctuation and pronunciation on the wall until school is out. The teacher might want to hang other charts only during specific units or lessons.

The use of charts in teaching and learning according to Pixton (2011), will help teachers to bring into reality what they teach and as such makes teaching more effective. Charts are good examples of visual presentations which assist pupils in understanding ideas more than when the teacher just talks. Use of charts helps the teacher to bring about connections within and between concepts been taught as well help pupils make connections and applications. Hanks (2011) advised that in order to bring about this connection the charts need to be properly prepared to be relevant to the particular concept being taught. Furthermore, the use of charts in teaching and learning is highly advised because it unfolds a whole lot of ideas that real life models may not unfold. Hanks further averred that use of charts can help clear any doubt and misconception the learners may have. The visibility of teaching is achieved through the use of charts. This makes teaching and learning process more interesting. Akpan (2014) hinted that Charts can be used for demonstrations, practicals and collaborations. Akpan noted that each of these strategies calls for skillful and effective use of the chart.

On learners' assessment, Buckie (2016) held that charts are useful in completion of formative assessment in the classroom and they also allow the teachers to find out students' prior knowledge in a particular topic. Nuhu (2015) submitted that since chart is one of the visual aids that can be used in teaching and learning process, it can be used to make reasonable comparisons with real life situations. Chart as information in the form of diagrams, lists or drawings will often display the relationship between concepts for the pupils to refer to. Chart also can be used to illustrate many types of data. It is also usually called diagram since the material that will be taught is about expressing the facts and figures. Therefore, for effective teaching and learning, chart could become the appropriate

media to be used. On importance of use of charts in teaching and learning, Akpan (2014) stated that chart improves the level of retention among leaners. Using charts during a lesson helps engage leaners a lot. Many leaners are visual learners, so they understand and retain information better when the concepts are associated with images in charts. Akpan advised that when creating a chart or diagram in front of the leaners, the teacher should pause to ask questions or to invite the leaners to help him complete the chart. This is an effective teaching process.

Still on importance of use of chart, George (2016) added that it improves the understanding of a topic. Learners tend to have a better understanding of topics taught with the use of charts as its outcome steers them in the face, bringing to life their imaginations and clearing all doubts and misconception. The visibility of teaching is achieved through the use of charts consequently making teaching and learning process more interesting and understandable. With easy comprehension, retention and understanding of topics through the use of charts in teaching and learning process it is expected to lead to an improved academic achievement and interest. However, research findings have shown conflicting results on the effect of use of charts on middle basic pupils' achievement and interest in literacy, hence, justifying this study.

Basic Education

Basic education encompasses those skills, knowledge and attitudes necessary for an individual to adapt and function effectively in his immediate environment. The global and dynamic nature of the society has created the need for skills and knowledge to be updated for one to hold onto his position or advance. This nature of education was noted during the World Education for All (EFA) Conference in Jometien, Thailand, in 1990. The conference rang a death-knell on the traditionally rigid, prescriptive education system and ushered in an era, where flexibility could thrive in planning and administration of educational programmes. Consequently, education is no longer meant for any age bracket.

This brings to the fore, the concept of "Universal Education". According to the UBE Report (2001:7) the universal aspect of basic education has the following implications:

a. Inclusiveness: Implying that person in all manners and conditions of physical, spatial and psychological existence will benefit from the programme
b. Special attention to special groups: Implying that special needs of all sectors of the population will be take into account
c. Encouragement for the provision of facilities for early childhood education and development with due attention given to the need of specific social groups and geographical zones of the country, bearing in mind the need for specific social groups and geographical zone of the country, bearing in mind the need to lay solid foundation for the life-long learning from early childhood.

Another attempt in defining Universal Basic Education was made during Dakar Education Conference (2000). That conference has stated that Basic Education 'encompasses' not only primary education, but also early childhood programme, using both formal and informal approaches, it must take account of the needs of the poor and most disadvantaged, including working children, remote rural dwellers and nomads and other linguistic minorities, children, young people and adults affected by conflicts, HIV/AIDS, hunger and poor health and those with special needs. These observations are that the UBE, in scope and content should not be discriminatory in application, ages, sex, educational level or status are, therefore, no hindrance to the right of Basic Education for the process of human development which is measurable, sustainable and environmentally friendly, the role of Basic Education in providing the necessary skills, knowledge, information and right attitudes will, therefore, be invaluable.

Implementation of the Basic Education and the Millennium Development Goals in Nigeria

The World Declaration of Education (1990) brought about the adoption of Education for All (EFA). Subsequently, in the year 2000, the Millennium Development Goals was adopted. These are two important landmark programmes of the United Nations aimed at addressing social problems that hinder development especially in developing countries. As the Education for All (EFA) programmes specifically addresses the problem of high illiteracy, the Millennium Development Goals (MDGs) set agenda for a holistic approach to issues that threaten human development.

The emphasis on human development has become a departure from the traditional view of development as an upward climb in economic growth of a nation. There has, therefore, emerged a paradigm shift on what constitutes development. Harris (2000) observed the works of Paul Streeton and Leroy on the use of education, health, nutrition, sanitation, and employment in measuring development. He is of the opinion that the use of social indices in measuring development is reflecting on the acknowledgement that the benefits of development does not necessarily "trickle down" to those that needed them most. It is also against this backdrop that the United Nations Progress Human Development index, uses health and education measures, together with Gross Domestic Product (GDP), to calculate the overall index of development. To show commitment in the direction of human development, in line with the United Nations development agenda, nations have come up with programmes to address these basic development needs in their countries. In Nigeria for example, the governments have launched the Universal Basic Education (UBE) to see to the implementation of functional literacy, numeracy and life skills, especially for adults, out-of-school children and non-formal programmes for updating knowledge and skills. There is also the National Commission for Nomadic Education (NCNE), to implement the nomadic programmes. There is also presidential committee on an assessment of the MDGs quarterly. These bodies and commissions are supposed to give the necessary impetus in the implementation of the developmental programmes.

However, available information shows that despite the agencies and programmes aimed at alleviating poverty and bringing about development, little progress has been recorded in the country's development index. For instance UNESCO (2005) in Otobo (2018) classified Nigeria as one of the nine countries in the world that account for 80% of global illiterate population despite attempt at universal basic education. In Nigeria, one of the national dailies, Vanguard of January 18, 2008 also reported that out of 42 million eligible children of school age in the country, only 22.3 million were in primary schools; the implication is that, 19.8 million children, who should be in primary schools, were out of schools.

In the area of adult education, Lim (2000) has complained that "despite numerous declarations and commitments, the number of adult illiterates in the countries have continued to increase, as today 125 million children in developing countries are deprived of any form of organized education". Assessment, according to her, showed that focus in the last decade has been on formal education with inadequate attention to non-formal model of learning and acquisition of skills. The continued increase in the number of school-age children out of school and non commitment for the promotion of adult education programmes are pointers that the governments especially in Nigeria lack the political will to address the developmental needs of the people. They have also failed to take up the opportunity granted by the international community during the World Education Forum (2000), when they poined that "no country seriously committed to basic education will be thwarted in the achievement of this goal by lack of resources".

This lack of commitment is also demonstrated by the low level of funding of education in Nigeria. According to the National Economic Empowerment and Development Strategy (NEEDS) (2019), from 2004 to 2007 no government in Nigeria is known to have allocated more than 10% of the annual budget to the education sector despite the UNESCO recommendation of 26% minimum allocation for the education sector. In addition to the low level of funding is the "legitimacy gap" between what is approved for the sector and amount actually released. At times, half of the allocation is released for implementation. The Federal Government is not alone

in this attitude of lip-service to the implementation of educational programmes. In the words of olayinka (2015), "every state in Nigeria claim to be operating the UBE, but everywhere, parents of pupils and students pay fees, levies, buy uniform and books, pay transport and midday meals and snacks".

Implementation of the MDGs has not fared better either: poverty and hunger continue to ravage the people. According to the national Economic Empowerment Strategy (NEEDS) (2004), "in 1980 27% of Nigerians lived in poverty, 70% of the people by 1999 have income less than one dollar a day. There is continued lack of basic services such as clean water, education and health care, supportive networks of friends and family, lack of income, including food, shelter, clothing and empowerment. The average life expectancy of Nigerians is put at 54 yars. Infant mortality was at 77 per 1000 and maternal mortality 703 per 100,000 live births. Unemployment falls from 18% in 1999 to 10.8% in 2003". These statistics show that the government has little or nothing to show for the continued increases in the oil revenue which the country has continued to witness over the years. However, more commitment and political will on the part of government and government agencies saddled with the responsibilities of these developmental programmes can bring about more changes. The realization of the goals of the MDGs may continue to be a dream, if the attitude of the government does not change in reversing the high illiteracy level in the country through a pragmatic pursuit of the Universal Basic Education Programme to serve as means for realizing the goals of MDGs.

UBE in National Development

Federal Republic of Nigeria (2013) in the National policy on Education identifies education as an instrument par excellence for effecting national development plans. It also stipulates that education shall continue to be highly rated in the national development plans because education is the most important instrument of change. Universal Basic Education (UBE) aims at ensuring an un-interrupted access to n9 year formal education by providing free compulsory Universal basic Education to every child

of school age, reduce school drop-out and improve reliance, quality and efficiency and ensure the acquisition of appropriate levels of literacy, numeracy, manipulative, communicative and live skills. By mastery of the use of essential tools (reading, writing and computation) the learner is able to earn his living and satisfy his needs, including his responsibility as a member of the Nigerian society. He is thus formed to perform to the best of his ability. UBE is geared towards the preservation and reformation of Nigeria and also aims at providing access to and ensure quality of basic education throughout Nigeria. The improvement of the citizen leads of the improvement of the society.

A security of the scope and objectives of UBE reveals the functionality of its curriculum. It must entail those basic knowledge and skills necessary for life-long education. Life-long education according to Faure (1972) in Okam and Bozimo (2002) covers the entire process of education from the point of view of the own life as he deserves but it is also designed to help the future adult prepare for various forms of autonomy and self learning. It covers formal, informal and non formal activities. Formal activities concern those activities planned and executed within a school setting. Informal activity refers to exposure to an unplanned course of activities taking place in anon-school setting. Non-formal activity is based on planned course of activities executed in a non school setting (Uchendu, 2013). Life-long education, which is the target of UBE, is learning that leads to self-development and self-actualization. It presupposes that individuals should have access to training whether in school or outside. And that there should b a link between the school and the community/home and that formal learning should be related to community realities.

Basic Education according to Mahatma Gandhi

At Round Table Conference in London (1931) Mohandas Karamchand Gandhi, also known as Mahatma Gandhi pointed out the ineffectiveness of the primary education system of India and the low percentage of literacy rate among Indian people. He blamed the policy of the British Government responsible for the pathetic situation in the field of mass education. Ghandiji described the main

defects of the system of education as, “I am fully convinced that present system of education is not only wasteful but positively harmful. They would pickup evil habits. English has created a permanent bar between the highly educated few and the uneducated many.” He further said, “let us now cry a halt and concentrate on educating the child properly through manual work not as a side activity but as a prime means of intellectual activity” (Maheswari). Mahatma Gandhi proposed his scheme of Basic Education (Nai Talim) in a well formulated approach to education in 1937 in his news paper ‘Harijan’. In order to discuss different aspects of the scheme of education, an All India education conference was held in Wardha on 22nd and 23rd October, 1937. The conference is called Wardha Educational Conference and Gandhiji himself presided over the conference. After serious discussions, the following four resolutions were passed in the conference (Maheswari). 1) Free and compulsory education is to be provided for seven years on a nationwide scale. 2) Mother tongue should be the medium of instruction. 3) The process of education throughout this period should have some manual and productive work and ability should be developed to engage them with handicraft work according to the environment of the child. 4) The proposed system of education would gradually be able to generate remuneration of the teachers. Basic education or Nai Talim was based on the fundamental principle of “learning by doing”. Gandhiji believed on action and hence his concepts of basic education can be classified as activity method or practical method. It was mainly a method of co-relation between book learning and doing activity through craft like gardening, weaving, spinning, carpentry, etc. According to him, a realistic scheme of education must be closely integrated with the physical and social environment of the student (Gandhi). He said, “It is called the new method of education, for it is not a foreign importation or imposition, but is consistent with the environment in India which is predominantly made up of villages. It believes in establishing equilibrium between the body, the mind and the spirit of which man is made. It is unlike the Western type which is predominantly militarist, in which the mind and the body are the primary care of education to the subordination of the spirit. This is

best done when education is given through handicrafts. The other specialty is that it is designed to be wholly self-supporting. It does not, therefore, demand an expenditure of millions on education." (Harijan, 11-5-1947, p.147). Some important features of Gandhiji's Basic Education According to Gandhiji and his philosophy, the important features of basic education may be listed as below. 1. Free and compulsory education for all- Gandhiji wanted the basic education should be free and compulsory for all boys and girls between the ages of seven to fourteen. According to Gandhiji, "I am a firm believer in the principle of free and compulsory primary education for India. I also hold that we shall realize this only by teaching the children a useful vocation and utilizing it as a means for cultivating their mental, physical and spiritual faculties. Let no one consider these economic calculations in connection with education as sordid or out of place. There is nothing essentially sordid about economic calculations." (Harijan, 9-10-1937, p. 292) 2. Mother tongue as medium of instruction- Gandhiji, believed that the medium of basic education should be the mother tongue. Strong mother tongue foundation leads to a much better understanding of the curriculum as well as a more positive attitude towards school. Language and mother tongue play an important role in the development of personal, social and cultural identity of a child. Children with a strong foundation in mother tongue can have deeper understanding of the curriculum and develop confidence to tackle any situation. When children develop their mother tongue, they will develop other essential skills, love towards mother tongue and incline towards motherland. 3. Craft centred education- Gandhiji emphasised on craft-centred education which had great importance in Indian scenario. In Indian scenario, craft would make education self-supportive as it is not possible to educate all citizens and provide them government jobs. So, the craft centred education would help to provide employment opportunity to all citizens and make them self-sufficient. According to Gandhiji, the method of training the mind through village handicraft from the beginning would develop disciplined mind. Such practical productive work in education would to break down the existing barriers of discrimination between manual and intellectual workers. The

scheme would increase the productive capacity and utilise their leisure profitably also (Maheswari). According to Gandhiji (Prabhu) "Craft, art, health and education should all be integrated into one scheme. Nai Talim is a beautiful blend of all the four and covers the whole education of the individual from the time of conception to the moment of death….. Instead of regarding craft and industry as different from education, I will regard the former as the medium for the latter." (Harijan, 10-11-1946, p. 394). 4. Development of creativity and critical thinking- Gandhiji emphasised on the principle of 'learning by doing' which stimulates the individual's mind to think creatively and critically. His great emphasis on work-culture to the students from initial stage was to enable the students to start producing while learning. So, his primary aim of basic education was to utilise head, heart and hand rather than concentrating on reading or writing only. In July 1937, Ghandiji wrote in the Harijan, "By education I mean an all-round drawing out of the best in child and man-body, mind and spirit. Literacy is not the end of education nor even the beginning. It is only one of the means whereby man and woman can be educated. Literacy in itself is no education. I would therefore begin the child's education by teaching it a useful handicraft and enabling it to produce from moment it begins its training. Thus every school can be made self-supporting, the condition being that the State takes over the manufactures of these schools." (Harijan, 31-7-1937, p.197) 5. Emphasis on collaborative learning- True education is a lifelong process which helps in cultivating the spirit of co-operation, tolerance, collaboration and a sense of responsibility. All these qualities are required for the development of human personality which can create the pleasant balance between the individuals and social aim of education. Gandhiji always emphasised on collaborative learning. Craft work helps a child to acquire collaborative learning skills and to realize the value of honest labour. 6. Importance on moral education- Gandhiji thought that the peace is essential for human life which can be attained through education. Peace can be attained only through morality and ethics. According to him, education must be based on ethics and morality. Gandhiji advised to all students to consider morality and honesty as

essential parts of their education. He said, “Our system of education leads to the development of the mind, body and soul. The ordinary system cares only for the mind.” (Harijan, 9-11- 1947, p. 401). “I attach far more importance to the cultural aspect of education than to the literary.” (Harijan, 5-5-1946, p. 120) 7. Emphasis on character building- Education is the most powerful weapon which helps to build genuine characters of a student. The goal of education should consist of character-building. The character-building includes the moral, intellectual and social behaviour of a pupils under all circumstances. A pupils should develop personality, compassion, kindness, fair-mindedness and the spirit of dedication by virtue of education. Gandhiji said, “When it is remembered that the primary aim of all education is, or should be, the moulding of the character of pupils, a teacher who has a character to keep need not lose heart.” (Harijan, 1-2-1933, p. 3). 8. Development of self reliance and patriotism- The main purpose of basic education was to achieve an integral development of children and to create a sense of patriotism though practice of handicraft. Gandhiji desired that the basic education system should be self-supporting for every child by learning a craft or occupational skill for livelihood. He wanted education to ensure employment. He told “My Nai Talim is not dependent on money. The running expenses should come from the educational process itself. Whatever the criticisms may be, I know that the only education is that which is 'self-supporting'.” (Harijan, 2-3-1947, p.48). He also said, “The teachers earn what they take. It stands for the art of living. Therefore, both the teacher and the pupil have to produce in the very act of teaching and learning. It enriches life from the commencement. It makes the nation independent of the search for employment”. (Harijan, 11-5-1947, p. 145). 9. Development of faith on Truth & Non-violence- Gandhiji was always considered that non-violence is an important and essential part of education. Truth & Non-violence was the fundamental formula of Gandhiji’s philosophy. Basic education too was also based upon the principle of truth and Non-violence. As he said “I want to see God face to face. God, I know, is Truth. For me the only certain means of knowing God is non-violence-ahimsa-love. I live for India’s freedom and would die for it, because it is part of Truth.

Only a free India can worship the true God. But my patriotism is not exclusive; it is calculated not only not to hurt any other nation, but to benefit all in the true sense of the word. India's freedom as conceived by me can never be a menace to the world" (Young India, 3-4-1924, p. 109). 10. Awareness on Social Services- pupils should be involved in different community services to develop responsibility and create awareness on social services. Education must be based on social good, welfare for all and must uplift the human aspect. The basic education by Gandhi aimed at encouraging the spirit of service and self-sacrifice. Addressing the college students once he said (Shah) "Your education, if it is a vital thing, must shed its fragrance in your surroundings. You must devote a certain portion of your time daily to serving the people around in a practical manner. You must therefore, be prepared to take the spade, the broomstick and the basket. You must become voluntary scavengers of this holy place. That would be the richest part of your education, not learning by heart literary thesis." Mahatma Gandhi was a true social worker fighting against the evils of society. Mahatma always said, if we want to do social work, we should start it by ourselves. 11. Sensitise on Cleanliness and Untouchability- pupils should be sensitised on merits and demerits of cleanliness and the evils of untouchability. Gandhiji had been opposing untouchablity and caste system from very beginning and putting relentless efforts to eradicate. Gandhiji was arguing that Brahmins and untouchables were equal in his eyes. Gandhiji was publicly rejecting the notion of high and low caste feeling. At the age of twelve, Gandhiji had disagreed his mother's warnings on not to touch an untouchable who used to clean their latrines in their house. Gandhiji tried his best to break the centuriesold caste system and to remove the mark of untouchability from Hinduism. Gandhiji described (Prabhu) on his conception on Samagra Gramaseva in Harijan (17-3-1946, p.42) that "I will inculcate in them the importance of hygiene and sanitation, and when they come and ask me for a sweeper, I will tell them: "I will be your sweeper and I will train you all in the job".

Basic Education in Nigeria

The desire of the nations of the world to reduce illiteracy, combat ignorance and encourage access to education even to the grassroots necessitated Education for All (EFA) as stated above in the Jomtien Declaration which was a treaty launched and signed in Jomtien Thailand in March 1990 (Egbe & Eze, 2009). The intent was to ensure that education gets to every member of the world societies. This declaration though as a reinforcer but it was not the first Education for All call. The first call could be traced back to 1948 which came with the Universal Declaration for Human Rights and because education is perceived as a human right, it became imperative for its inclusion as one of the rights to be enjoyed by man (Maduabuchi, 2008). But for Nigeria, according to Amadioha (2016) the original advances made at making education universal to her people could be traced to the 1950s and 1960s when the Nigerian regional government brought to light Universal Primary Education (UPE) under the leadership of Late Pa Obafemi Awolowo and directed by Chief S.O. Awokoya as minister of education in the Western region as at the time specifically between 1952 and 1954. The Eastern region also made an attempt at institutionalizing their own UPE programme too in 1957 under Late Dr. Nnamdi Azikiwe, but this particular attempt failed woefully due to lack of manpower and funds (Jeremiah & Alamina, 2017), for the Northern region, their attempt at carrying out the same programme did not see the dawn of light because of a lot of problems that the region faced then and the programme was completely stalled as the nation woke up to war in late 1960s. When the government took over schools just in 1973 after the Civil War, the Federal Military Government on 6th September 1976 under the leadership of the then head of states General Olusegun Obasanjo reintroduced the UPE programme but at this second attempt of the UPE programme in 1976, it failed again as a result of poor planning, unavailability of demographic statistics, poor funding and corruption in the governmental and educational system (Jeremiah and Alamina, 2017). Again, with the National Policy on Education in 1977 document publication and launching which resulted from 1969 National Curriculum Conference, this then set the ball rolling for UPE to take its foothold, few years later

in 1981, the document was revised, (Amadioha, 2016). The mandate so placed on the UPE programme was mandatorily to go on and produce qualitative educational outcomes. But this goal of a qualitative universal education for the citizenry of Nigeria never really took root until the 1990 declaration of education for all because the programme within the period under consideration encountered so many difficulties that the government of the day was not really able to manage effectively and efficiently or even surmount. These pitfalls as enumerated included political instability, inconsistent policy formulation and implementation, and sustenance, lack of sincerity on the part of the programme implementers, unavailability of statistical records, uncoordinated planning and execution practices, low institutional capacity, poor technical competence, poor logistic support system and neglect of available teachers. The foregoing clearly is indicative of what could be described as a hill-valley state for the UPE programme and the arrangement of primary education particularly Education for All in Nigeria over those years because of instability appearing in all its forms and dimensions leading to disequilibrium in actualizing the intent of educating and producing citizens that would make useful contributions to the society (Benson, 2008). However, at the return of democracy government with President Olesegun Obasanjo again on the saddle of leadership in 1999, specifically in September and in Sokoto State, the Universal Basic Education (UBE) was launched still with the intention to pursue the treaty of Education for All (EFA). According to Akor (2018), in the speech of Mr. President, he unequivocally stated that the educational system would be free and compulsory for every Nigerian child who is of school age and this bold declaration actually supports and agrees with the dictates of the National Policy on Education which is to achieve the goals of Education for All through the following objectives of the UBE programme: a. Develop permanent literacy and numeracy, and ability to communicate effectively. b. Lay a strong foundation base for scientific and reflective thinking. c. Give citizenship education as a ground for effective participation and contribution to social life. d. Mould character and bind sound attitude and morals in the child. e. Develop in the child the ability to adapt to the child's

environment. f. Give the child opportunities for developing manipulative skills that will enable the child to function effectively in the society within the limits of the child's capacity. g. Provide the child with basic tools for further educational advancement including preparation for trades and crafts of the locality. The major essence of the UBE programme from the stated objectives and possibly its effective and proper implementation of the intents is to ensure that each child is built up with marketable skills that would enhance self-employment as well as reduce the dependence on paper qualification (Fowowe, Akinkuotu & Shittu, 2009). This definitely confirms what the world was aiming for when the EFA declaration was pronounced, launched and signed in Jomtien, Thailand in March 1990.

Characteristics of the New Universal Basic Education

The UBE programme features according to Fowowe, Akinkuotu & Shittu (2009) are: 1. Free and formal basic education. 2. Compulsory, smooth 9 years of primary and junior secondary education. 3. Emphasizes curriculum diversification and relevance. 4. Core basic subjects like English Studies, Mathematics, Cultural & Creative Arts, Physical and Health Education, Language (Hausa, Igbo & Yoruba) Religious Studies & Info Tech./Computer Studies. 5. Optional Subjects like Arabic, Agricultural Science and Home Economics. 6. Introduction of French from basic 4 as a core subject. 7. Merger of Basic science and Basic technology. 8. Inclusion of Business Studies from JSS 1. 9. Separation of Basic Science & Basic Technology from JSS 1. 10. Introduction of contemporary issues from National Economic empowerment. 11. Peace Studies & entrepreneurial skills contents. 12. Education of special needs children etc. Guideline for the implementation of UBE Programme 1. Programme for early childhood care and socialization. 2. Education for the acquisition of utilizeable literacy skills, numeracy and life skills. 3. Special programme for nomadic individuals. 4. Out-of-school, non-formal programme for knowledge upgrade. 5. Non-formal skills acquisition and apprenticeship training for younger people (Amadioha, 2016) Having stated these intents and guidelines on what the pursuit of the UBE programme should be, it

becomes very vital that an appropriate execution tactics be drawn out in order to ensure that the programme does not fail, hence, oluremi (2014) documented the procedural approach the agency of government saddled with the responsibility of the implementation mapped out to prosecute the programme in stages and phases, such that cumulative success result would be recorded, this shows an incremental pupil (s) admission into the UBE programme. It is stated thus: UBE year 1 Primary I of 2000/2001 UBE year 2 Primary I & II of 2001/2002 UBE year 3 Primary I, II & III of 2002/2003 UBE year 4 Primary I, II, III & IV of 2003/2004 UBE year 5 Primary I, II, III, IV, V & VI of 2004/2005 UBE year 6 Primary I, II, III, IV, V & VI of 2005/2006 UBE year 7 Primary I, II, III, IV, V, VI & Junior Secondary School 1 of 2006/2007 UBE year 8 Primary I, II, III, IV, V, VI, VII & Junior Secondary School II of 2007/2008 UBE year 9 Primary I, II, III, IV, V, VI, Junior Secondary School III of 2008/2009 The original intention was that within this period, the local government councils would take up the responsibilities of achieving the stated objectives below: 1. Encourage quality teacher development. 2. Upgrade and modernize infrastructural facilities in schools. 3. Make available instructional materials for learning. Therefore, it was suggested that to achieve these intentions according to oluremi in Amadioha (2016), who disclosed that the transition and intake rate from what the current situation is should stand at as stated below in percentages such that would not be cumbersome for the implementers and financiers to manage: 2001 – 2002 - 55% 2002 – 2003 - 65% 2003 – 2004 - 75% 2004 – 2005 - 85% 2005 – 2006 - 95% 2006 – 2007 - 100% This is an incremental percentage transition rate of 10% per annum. This would be requiring the government to put into the programme a total sum of six hundred and sixty eighty point seven billion naira on (N668.66bn) and it was projected to salvage education problem of out of school children to the tune of 98.6 million pupils from the streets into the UBE programme within the projected period. Matters Arising on the current state of UBE programme A lot of issues are on ground as it was observed that the EFA deadline of 2015 to achieve education for all through the Millennium Development Goals (MDGs) target did not go near at attending to the UBE

Programme's situation, which was said to be as a result of some teething problems some of which have been with basic education acquisition,while others are either novel in nature or have returned to the platform in a different dimension. These matters include: 1. Poor budget to the education sector. 2. Poverty. 3. Ignorance among the people. 4. Poor learning environment and culture. 5. Lack of competent teachers. 6. Poor motivation of the teaching personnel. 7. Poor infrastructural facilities. 8. None or Inadequate supply of learning materials. 9. Poor attention to sports and recreational activities. 10. Non-existent of special education programme or inadequate facilities for learning. 11. Poor mobilization of partners. 12. Corruption. 13. Poor policy planning and implementation strategies. 14. Insincerity in government practices. 15. Inadequate statistical data for planning. 16. Poor logistic supply from the closet government support. 17. Total neglect of the teaching profession. 18. Lack of trust for government promises. 19. Instability in the polity leading to incessant change in leadership. But again, it is vital to present what a lot of people assume to be the basic issue plagueing UBE in Nigeria in these years as funds.

Prospect of UBE for the Nigerian Populace and Nation

1. **Preservation and transmission of our social, moral and cultural values:** In basic education, through curriculum, pupils/students will be acquainted with social, moral and cultural values and teachers make them familiar with values and ideals through different activities, games, story-telling etc. Basic education makes them familiar with constitutional issues, rules and regulations of citizens and so on even if they may not be aware of the source of the information they are being taught. As we find in (FRN, 2013), major objectives to produce a productive citizen has been fulfilled by basic education, so basic education preserves our values and it make others to imbibe those values.

2. **Awakening of Social feelings:** By basic education, individuals gradually become aware about the importance of unity, love, fraternity and other values. Basic education

makes all people get awakened of being a part of the society and how they can contribute to the world as society in their own little way. People know different values and life skills and thus they develop concern for society including social mindedness, values life skills, learning to be, learning to do, learning to know, learning to live together via different activities, story-telling, dramatization, e.t.c.

3. **Political development of society:** Basic education makes all aware about rights and duties of all, which are their responsibilities and duties so that they can develop their civic sense. Through different lesson of political leaders and stories of education leaders they develop ideal leadership quality so that in the future citizens can lead the state as a society. All these begin by their being given opportunities to serve as class monitor or class captain as they are called and at other times during group learning opportunities are given for the selection of group leaders. These and more help these young people develop their innate potentials for leadership.

4. **Economic development of society:** Basic education develops skills in an individual and makes him a productive citizen. Through basic education everyone learns how to earn money using handcrafts and as per the qualification, he gets a job or labour and on the whole with the help of more education more or less everyone gets professional work and earns money so due to increasing literacy per capita income will increase. Because of education people migrate to parts of a country or to other countries and their earning helps to develop the society in a larger sense. Thus, even basic education affects the economic development of society as it ought to.

5. **Social control:** Basic education makes all aware about customs and duties, the same way as it makes all aware about the rules and regulations as we find the rules in Nigerian

constitution. People know how to preserve their lives via basic education. It make us also familiar with crimes. Thus, basic education provides a guideline and it controls all society on how each person conducts his/her daily life.

6. **Social changes and reforms:** Basic education makes individuals near perfects and aware about their rights, in order that they can kick against superstitions and beliefs that are harmful for them. Through basic education everyone learns to grow, to live and how to be saved from difficulty and how to inculcate values and ideals in their lives and in others as well as in the that of the wider society and even so that whenever there is need to demand/ can appeal in court during a feeling of injustice. Basic education makes all aware about how to live peacefully and how to face difficulties in their lives .It makes one become aware about the proverbs like 'nothing ventured, nothing gained' so one develops ones risk taking attitudes via education.

7. **Socialization of a child:** Basic education trains the mind of a child and it teaches him how to inculcate values in his life. It makes the child understand what is society, how he is a part of society, what are his roles in the society, how he should behave, how he should interact with others etc. Basic education helps him to understand who he is? And it develops a sense of a social being in him. In short education socializes a child. Thus, Basic education produces productive citizens, it helps everyone on how to flourish and make himself/herself an ideal citizen of the society. To sum this up, basic education influences the society. This is basically the reasons the government of this country earmarks a huge amount of money in funding the universal basic education from its inception up to this day as discussed below even though the entire sum budgeted to the education sector is paltry not even up to half of the UNESCO benchmark of 26% of the nation's total budget.

The Way Forward for Universal Basic Education in Nigeria

The challenges facing Universal Basic Education (UBE) are enormous and glaring in the eyes of the people of Nigeria, therefore, it becomes imperative for us to pursue overcoming them in order for the UBE programme to find relevance in the society. Some of the actions to be taken to mitigate these problems are:

1. **Teacher competence and Quality:** Some of the teachers involved with managing our UBE programme have the paper qualification but not the knowledge qualification. Therefore, it is important for teachers in this programme to upgrade their knowledge, requisite abilities that would enhance the output of the UBE programme. In fact, Nigeria must guide against the repeat of what happened to primary school teachers in Edo and Kaduna states where teachers were sacked because the quality they possessed to be able to teach the pupils to produce result and excellence was questionable (Amadioha & Akor, 2018).

2. **Inadequate resources:** The challenge of inadequate resource for teaching and learning in the most inappropriate manner must be ensured to be tackled by the education stakeholder in order for better learning to be produced in the pupils and also for them be able to fit properly into the society as required. Currently, the school around seem not to be receiving adequate attention that would make the pupils learn well the way it should. A lot of resources ranging from building, instructional materials, the seats, other resource persons etc. are lacking, let these things be produced and made available in partnership with the government.

3. **Cost of equipment and access to technology:** The cost of equipment needed for training people in the Universal Basic Education (UBE) has not been enough in recent times. The major essence of basic education is to make people functional members of the society, so certain equipment that would build people up with the required skills needs to be

provided. Technology era is what the world is in, therefore, every technological assistance needed for the training of the people with basic skills is needed to be provided by the government (Madu & Orji, 2002).

4. **Motivation for teachers:** Teachers should be motivated to be able to perform their duties as expected. Teachers have a great role to play in the life of the learners, hence, their motivation should become a priority to their employers. Teacher's job performance is tied to how much motivation he/she gets. Lately, teacher's motivation in Nigeria is very low, so let there be a rejigging of this area of the teachers life for enhanced productivity.

5. **Promote active learning among pupils:** The pupils should be encouraged to own the lesson, as the pupil should be actively involved in the teaching and learning process in that each lesson episode leaves the pupils as doing constructive learning and the teacher facilitating the process of teaching. This would encourage more and better output from the Universal Education programme.

Unarguably, one major way of promoting active learning among pupils is use of appropriate and effective instructional media. Hence, this study is not only vital but very timely as it focused on use of instructional media to facilitate pupils' achievement and interest in classrooms.

Achievement

Olayinka (2015) asserted that the word "achievement" is the noun form of the verb "achieve". Hence, achievement is the process of bringing about or accomplishing something through effort, skill or courage. In this work, achievement strictly referred to academic achievement and specifically, academic achievement in middle basic education English language, more specifically literacy. Academic achievement generally suggests an achievement relating

to education and scholarship, (Nnamani, 2018). According to Hanks (2019), academic achievement depicts pupils' performance on a standard of measurement such as performance test, skill test, analytical thinking test, etc. It is therefore, not out of place to describe academic achievement as the gain in knowledge of pupils as a result of taking part in a learning activity or programme. Learning here refers to changes in a person's behavioral repertoire rather than just a change in behaviour. Academic achievement is a result-oriented construct that encapsulates the extent of performance of a desired task, (Kennedy, 2019).

Pixton (2014) argued that since academic achievement is a measure of pupils' success in an academic setting, it is therefore the goal of parents, teachers and school administrators to foster achievement so as to elicit the desired learners' success. One of the ways to foster achievement, according to Pixton is to adopt effective instructional media. Berceky (2012) stated that pupils' achievement in literacy, just like every other school subjects is usually measured using assignments, projects, tests and examinations. These achievement measurement tools are used to assess (evaluate) the worth of the pupils' learning and as well predict their future academic endeavors. In this study, pupils' achievement in English language was measured using the Literacy Achievement Test. Derbuck (2014) affirmed the validity of the use of achievement tests especially in research studies designed to determine the effectiveness of two or more instructional strategies and or methods. Similarly, Akpan (2014) advanced that the major advantage of use of achievement tests is that apart from estimating the relative effectiveness of an innovation, achievement tests also identify areas of weaknesses in innovative techniques, thereby paving way for remedial action(s). This study therefore, did not only use the Literacy Achievement Test to infer on the efficacy of the audio animation instructional media and charts but as well used its findings to proffer veritable ways of maximizing the use of those teaching methods in circumstances where any of them becomes the most appropriate.

Hassan (2014) identified some factors that could determine pupils' achievement. They include teacher-qualification, teacher's knowledge of the subject matter and ability to deliver effectively, environment, pupils' state of mind, pupils' readiness, teaching method, availability, utilization and suitability of instructional media and teacher motivation. In the same vein, Oluremi (2014) grouped the factors under three broad sub-headings viz; teacher-related, pupil-related and environmental factors. Further-more, Isah (2014) classified the factors as follows; Knowledge-oriented, economic-oriented, psychological and environmental. The list is endless. However, this study restricted itself to one of the factors identified by Hassan (2014), that is, use of instructional media. Hence, concerted efforts were made to ensure that any observation made in the pupils' achievement (improved achievement in literacy or otherwise) can genuinely be attributed to the instructional media used (audio animation or charts). This is because this study attempted to ascertain the effect of audio animation instructional media and charts on pupils' achievement in literacy.

Interest

Kpakor (2014) defined interest as inward state of the mind towards something. Baraje (2015) described interest as a disposition, attitude and feelings of an individual towards an activity which shows behaviorally, the extent the person liked to participate in an activity. Dave (2015) defined interest as follows; "the state of wanting to know about something or someone", "the quality of making someone curious or attentive" and "subject about which one is concerned or enthusiastic". Similarly, Olayinka (2015) submitted that interest viewed from a generalized perspective is the feeling of one whose attention, concern or curiosity is particularly engaged by something. Alternatively, Olayinka saw interest as that which concerns, involves or draws the attention of or arouses the curiosity of a person. Also Kunlu (2015) defined interest as the feeling of intentness, concern or curiosity about an object.

More-so, Julius (2015) defined interest as the likes and dislikes of an individual. While Imuno (2015) defined interest as the quality which arouses concern or curiosity which holds a child's

attention on an object. Interest therefore is the power of exciting such concern and involvement that draws the attention of a person. Interest in literacy viewed from the afore-cited conceptual perspectives may be regarded as the mental and emotional disposition of individuals to engage in literacy. Hanks (2011) identified four interest types namely; manifested interest, tested interest, expressed interest and inventoried interest. According to him when an individual participates in an activity, Hanks interest is manifested. For instance, a pupil listening and carrying out class activities along with the teacher has manifested his/her interest. When achievement is measured, the scores indicate the scorer is interest in the subject, hence, this illustrates tested interest.

Expressed interest is seen when an individual declares his interest verbally. Inventoried interest is used to rate an individual's interest where many items or groups of items are involved. In this study, the instrument that was used to collect data on the pupils' interest was the Literacy Interest Scale (LIS) which combined the attributes of these four interest types. Additionally, Akpan (2014) hinted that interestingness is not a unitary concept, rather at least two different types of interest can be distinguished, namely; emotional interest and cognitive interest. Emotional interest is created by events that are arousing. Cognitive interest on the other hand is produced by the relationships between incoming information and background knowledge. Akpan explained further that interest can be generated by the intellectual activity of resolving incongruity, such as that entailed in making inferences.

These explanation suggests that instructional materials such as charts are more likely to increase cognitive interest than audio animation this is because charts require the learner to generate more inferences to fill the gaps between them. On the other hand, audio animations are more likely to increase emotional interest because they may induce higher arousal levels. Hence, George (2016) warned about what he referred to as "seductive details" in the use of learning materials such as games. These seductive details may make a learning/teaching aid more attractive but they are generally irrelevant.

Buckie (2016) further validated this claim when he asserted that seductive details show a negative effect on learning. Natshi (2016) observed that adding entertaining graphics to a scientific or mathematical text increased emotional interest but not cognitive interest. One possible explanation for the absence of effects of seductive details on cognitive interest is that the additional information may cause cognitive overload and distract the learner from the important information. Seductive details may not require the cognitive resolution that is the basis for cognitive interest Oluremi (2014), criticized the use of the term "seductive" to qualify audio animation and maintained that the efficacy of audio animation in eliciting both emotional and cognitive interest cannot be neglected. One of the major challenges of this study is to strike a balance between these controversial reports.

Another important aspect of a learner's motivation and interest is controllability or interactivity. Pixton (2011) observed that one strategy for enhancing the learner's motivation is to increase his sense of control and self-determination by providing choice or locus of control. It has been well documented that individuals offered choice show more enjoyment, better performance, and greater persistence at a variety of activities due to increased interactivity or controllability, (Hanks, 2011). Controllability and interactivity may differ among different instructional media. Consequently, in this study it was expected that the controllability and interactivity attributes of both audio animation instructional media and charts influenced the pupils' interest in literacy.

School Type (Public/Private)

In this study, school type is categorized into two, based on school ownership, namely, public and private schools. The term "ownership", according to Hassan (2014), is the act, state or right of possessing. Public school here refer to all schools owned, funded and overseen by either the local, state, or federal government. Private schools refer to all schools owned, funded and overseen by a private proprietor which may be either an individual, group of persons, religious organizations or any other non-governmental

organizations. It is important to clarify that some secondary schools run by some government departments or parastatals either as staff's children school or as a business enterprise are not directly funded and overseen by the government, hence, such schools are also classified as private. In Nigeria, such schools include police children school, POWA and NOWA schools, university staff schools, etc.

Kpakor (2014) submitted that over the years, school type in Nigeria has generated lots of concern to educators and various tiers of government. Kpakor further held that education generally was a religious bodies' or missions' affair in Nigeria, until the government took over schools with reasons that the missions were running the schools below standard. In the same vein, Isah (2014) narrated that when the government took over schools in the pre-independence era, Nigeria had practically only one type of education generally represented by the relatively few schools conducting a six-year course similar to those in the United Kingdom and leading to the Cambridge school certificate.

Nuhu (2015) reported another development when middle basic education was divided into three, viz; a government sector, an assisted sector and a non-assisted sector. The government sector constituted an important part of the whole system and after independence was considerably enlarged. It included a number of schools and those schools which were established as experiments. The assisted sector comprised part of the local government and private sectors receiving assistance through the grant-in-aid system. The remaining schools constituted the non-assisted sector the assisted sector included grammar schools, which were in the majority, some commercial schools in the West and Lagos, and the girls' modern schools in the East and Logos. The non-assisted sector included all modern schools in the west, a good number of schools and almost all commercial schools.

The FRN (2013) also states that government welcomes the participation of voluntary agencies, communities and private individuals in the establishment and management of middle basic education schools. Hence, the practice today is that private individuals, private associations or tier non-governmental agencies can operate schools according to their own principles, as long as

they comply with certain government requirements. For public or government schools, the present practice all over the federation is that the state governments own (fund and oversee) the schools in their territories apart from the federal government colleges funded and overseen by the federal government.

Al-Gazir (2013) lamented that the financial burden of owning the middle basic education schools is weighing down so many state governments, especially the non-oil producing states. Consequently, so many state governments tend to shy away from this major social responsibility of the state to her citizens. Thus even some state governments' decision to return some schools back to their original mission owners has been widely criticized as government strategy to shy away from their legitimate social responsibility (Natshi, 2016).

According to Akpan (2014), as the cry of falling standard in Nigerian educational systems increase, parents and guardians seem to believe that private schools is the solution, not minding that the major allegation that led to government takeover of schools from missions was that they operated the schools below standard. Evidently, the rate at which private schools spring up in almost every street, today tend to suggest that the business in incrative. Almost all uncompleted buildings and church premises are converted to private schools, mindless of the high cost when compared to public schools. Nduka (2018) reported that many private schools use unqualified teachers to run their schools. Specifically, some of the private schools use quack teachers to teach in primary schools. Agbo (2004) alleged that many private schools' environment are not conducive for teaching and learning. Whyte (2011) reported that things may not be different in public schools where facilities are vandalized, dilapidated and neglected. Also teachers play truancy and instructional materials are either non-existence or obsolete. From the fore-going, it becomes obvious that more investigations such as this work is very timely to look into the factor of school type with regards to pupils' achievement and interest in literacy.

CHAPTER 2

Topic:

INFORMATION AND COMMUNICATION TECHNOLOGY COMPETENCIES NEEDED FOR EFFECTIVE TEACHING AND LEARNING OF EDUCATIONAL TECHNOLOGY COURSES IN UNIVERSITIES IN SOUTH EAST NIGERIA

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Information

Information according to Akpoviano (2022), refers to news or knowledge given; facts or details about something. Igunma (2021) posited that information is message received and understood, any communication or representation of knowledge such as facts, data or inputs in any medium or form, including textual, numerical, graphics, cartographic, narratives or audio-visual form. To Adeleke (2021). Two great educators, King (2022) and Samuelson (2018), gave the etymology of the word information. According to King (2022) the English word information was apparently derived from the Latin stem (information) of the nominative (information); this noun is derived from the verb informare (to inform) in the sense of "to give form to the mind" "to discipline" "instruct", "teach" inform itself comes "to discipline", "instruct", "teach" inform itself comes (via French informer) from the Latin verb informare, which means to give form, or to form an idea of. Samuelson (2018), added that Latin itself already contained the word information meaning concept or idea, but the extent to which this may have influenced the development of the word information in English is not clear. Samuelson averred that the ancient Greek word information which

transliterates Plerophoria from Pleres fully and Phorein, frequentative of pherein, to carry through.

It literally means “fully bears” or “conveys fully” we shall then attempt to define the term information. Information according to Akpoviano (2022) refers to news or knowledge. Information is simply the result or outcome of data processing. Adeleke defined data as raw facts consisting of details relating to anything which are collecting into homogenous groups for inputs to a data processing system or unit to produce information. From the definition of data, there arises another important concept, the concept of data processing. Adeleke further defined data processing as a process consisting of those activities concerned with the systemic recording, arranging, computing, updating, displaying, and printing of details relating to any activity or transaction. Otto (2020), collaborated Adeleke’s views by submitting that information is refine data which have been put into a meaningful and useful context. Itoya (2020) held that information is that which informs, in other words, it is the answer to a question of some kind.

It is also that from which data and knowledge can be derived, as data represents values attributed to parameters, and knowledge signifies understanding of real things or abstract concepts. Kings added that as it regards data, the information’s existence is not necessarily coupled to an observer while in the case of knowledge, the information requires a cognitive observer. Kings therefore concluded that at its most fundamental, information is any propagation of cause and effect within a system. From the foregoing, information can be defined as any meaningful data, any bit of fact and/or figure capable of providing knowledge. Samuelson (2018) argued that the concept that information is the message has different meanings in different contexts. Thus, the concept of information becomes closely related to notions of constraint, communication, control, data, form, education, knowledge, meaning, understanding, mental stimuli, pattern, perception, representation and entropy. Samuelson further sees information as an ordered sequence of symbols from an alphabet, such as an input alphabet, x, and an output alphabet, y.

Information processing, thus, consist of an input-output function that maps any output sequence from x into an output sequence from y. the mapping may be probabilistic or deterministic. It may have memory or be memory less. Six attributes of information were outlined by Samuelson (2018), as Relevance, completeness, Accuracy, clarity, appropriateness and timelessness. Information should be relevant to the purpose it is meant to serve, information must be complete, and that is, it must contain the least amount of details that will facilitate productive decision making. It must be accurate, very correct and void of any atom of falsehood or doubt. Information should not be ambiguous; it must be clear. A misunderstood information is in no way better than a false information. Information must be appropriate, it must address what it ought to address, else it becomes useless to the receiver. Some information are meant to address strategic management principle, others may be most appropriate for tactical and operational management techniques. Information should be delivered when needed, a delay may be wasteful and very expensive to bear.

It is important to note that though information has been defined as processed and meaningful data, data and information, according to Otto (2020) can sometimes be correctly used interchangeably. This Otto argues, is because data may be information to another person, while what one takes as information is actually data for another person. For instance, the bursar of an institution may have processed wages of staff and arrived at a total wage bill for the institution. To the bursar, this final sum is a valuable information. But the Head of the same institution may need to add expenditure such as wage bill, electricity, transport, etc to arrive at the total monthly expenses of this institution. The data he used included total wage bill which was an information to the bursar. It can then be said that usage of the terms data and information depends on the purpose and on the receiver and sender. Hence, a part of data processing or data analysis, one may hear of information analysis. Otto (2020) defines information analysis as the process of inspecting, transforming and modeling information by converting information into achievable knowledge, in support of the decision-

making process. This process of tampering with already made information further introduces another concept.

The concept of InfoSec or information security. Otto described InfoSec as the ongoing process of exercising due diligence to protect information, and information systems, from unauthorized access, use, disclosure, destruction, modification, disruption or distribution, through measures and procedures focused on monitoring and detection as well as incident response and repair. In this information age, the role of information cannot be overemphasized. Information is the pillar and backbone of any organization. Reliable information is the most critical link and the most efficient index of sustainable development in any organization. Information liberates man from ignorance and docility. When humans are informed and liberated, then the human resource of various organization can be secured. The multiplier effect is that these informed human resources will facilitate the substantive harnessing and utilization of other resources. Very important as information may be, it is worthless and useless if not delivered to the right person or people at the right time. Worst still, information is destructive if delivered wrongly this leads us to the concept of communication.

Concept of Communication

The origin of the word communication was traced by Rex (2022) to the Latin word communicare, meaning "to share". Rex held that communication is the act of conveying internal meaning to another entity through the use of mutually understood signs and semiotic rule. Adeleke (2021) reaffirmed that communication is the transfer of information, ideas, beliefs, instructions or orders from one person to another. Rex listed the basic steps of communication as follows; Forming communicative intent, message, composition, message encoding, transmission of signal, reception of signal, message decoding and interpretation of the message. Every efficient and effective communication must have an objective and indeed a viable one. This purpose is the communicative intent which must be formed accordingly by the communicator. After formation of communicative intent, the message or information must be prepared,

organized or composed. Adequate skills are needed for composition of message.

The medium of transmission and the abilities of the recipients must be taken into cognizance. Else, the message may mislead, destroy or deceive the receiver. To encode the message, the same caution applies. The server may need to hide it from the human agent used as transmitter or conveyer, or the server may wish safeguard the message against trespassers or intruders or any form of interference. Yet in encoding the message, the server must ensure that the receiver has the needed competencies to decode what he encoded. This is followed by transmission of signals. Here, the message must be protected from any theft, hacking or distortion. The signal must be received in single and clear terms the receiver must be able to decode what the sender encoded and give the message the correct interpretation. Nothing can be as destructive as misinterpretation of message or information; the dangers and harms are almost unimaginable. From the basic steps of communication discussed above, four elements are identifiable. These include message, medium, sender and Receiver.

Message or information refers to ideas, beliefs instructions, commands or orders, etc. the message is the central focus of every other element of communication. The message (information) emanates from the sender, goes through the medium and reaches the receiver. In some other is called the messenger, in such cases, receives the message from the sender and delivers same to the receiver. Communication can be classified as verbal and nonverbal communication. According to king (2022) nonverbal communication describes the process of conveying meaning in the form of non-word messages. Nonverbal communication includes haptic communication, chronemic communications, gestures, body language, facial expression, eye contact, and how one dresses. Nonverbal communication also relates to intent of a message. Examples of intent are voluntary, intentional movements like shaking a head or winking, as well as involuntary, such as sweating. According to king speech also contains nonverbal elements known as paralanguage, eg. Rhythm, intonation, tempo and stress.

There may even be a pheromone component. Undoubtedly, a substantial percentage of human communication may occur through nonverbal expressions, and some through para-language. It affects communication most at the subconscious level and establishes trust. Likewise, written text include nonverbal elements such as handwriting style, special arrangement of words and the use of emoticons to convey emotion. Nonverbal communication demonstrates one Wazlawick's laws: "you cannot communicate. Once proximity has formed awareness, living creatures begin interpreting any signals received. Some of the functions of nonverbal communication in humans are to complement and illustrate, to reinforce and emphasize, to replace and substitute, to control and regulate, and to contradict the denotative message. To further explain the concept of communication, King (2022) described verbal communication as spoken communication. Humans communicate verbally through the languages they speak. King defined human language as a system of symbols (sometimes known as lexemes) and the grammars (rules) by which the symbols are manipulated.

The word "language" also refers to common properties of languages. Language learning normally occurs most intensively during human childhood. Most of the thousands of human languages use patterns of sound or gesture for symbols which enable communication with others around them. Languages tend to share certain properties although there are exceptions. There is no defined line between a language and a dialect. Constructed languages, such as Eperanto, programming languages, and various mathematical formalism is not necessarily restricted to the properties shared by human languages. Effective verbal or spoken communication is dependent on a number of factors and cannot be fully isolated from other important interpersonal skills such as non-verbal communication, listening skills and clarification. According to Rex (2022) communication is two-way process not merely one way thus an effective communication process should have the following characteristics;

i. Use standard terminology when communicating information.
ii. Request and provide clarification when needed.
iii. Ensure statement are direct and unambiguous.
iv. Inform the appropriate individuals with the mission or plans.
v. Communicate all information needed by those individuals or teams external to the team.
vi. Use proper order when communicating information for formal English-speaking groups.
vii. Use nonverbal communication appropriately.

Another vital aspect of the concept of communication, according to Adeleke (2021) is interpersonal communication. Adeleke defined interpersonal communication simply as the communication between one person and another (or others).

It is often referred to as face-to-face communication between two (or more) people. Both verbal and nonverbal, communication, or body language, play a part in how one person understands another. In verbal interpersonal communication there are two types of messages being sent: a content message and a relational message. Content messages are messages about the topic at hand and relational messages are messages about the relationship itself. Otto (2020) explained that relational messages come across in how one says something and it demonstrates a person's feelings, whether positive or negative, towards the individual they are talking to, indicating not only how they feel about the topic at hand, but also how they feel about their relationship with other individual. When texting or posting something on social media the relational message is lost and can cause people to misinterpret the message. Computer-mediated communication is a largely studied topic for this reason along with many others. Information is communication either as content of a message or through direct or indirect observation of something.

That which is perceived can be construed as a message in its own right, and in that sense, information is always communicated as the content of a message, (Igunma, 2021). On barriers to effective

human communication King (2022) listed physical, system design and attitudinal barriers. Physical barriers are often due to the nature of the environment. Surely some natural barriers exist when staff are located far away from one another. Obsolete equipment may also cause some physical barriers. Another physical barrier may be shortage of staff. Faulty system design can hamper effective communication in any organization, wrong organizational structure may confuse staff on whom to report to, or this may truncate effective communication in an organization. Staff may become uncertain about what is expected of them when there is lack of clarity, inappropriate information system and inefficiency in the system.

A faulty system will not have efficient staff supervision and even staff training. King explained that attitudinal barriers come about as a result of problems with staff in an organization. Poor management, lack of consultation with employees, personality conflict, delay of communication or refusal to communicate, personal attitude of unmotivated or dissatisfied staff may all cause attitudinal barriers. In the same vein, Samuelson (2018) added three more barriers namely; ambiguity of words, psychological and technological multitasking and absorbency. Ambiguity of words and phrases may occur when words that sound same are used. It may also occur when jargons or technical terms not familiar to the recipients are used in communicating information staff individual personal discomfort may result in psychological barriers. Some of such discomforts are caused by ill health, financial problems, depression or even low self-esteem occasioned by social status or other form of degrading factors.

With a rapid increase in technological-driven communication in the past several decades, individuals are increasingly faced with condensed communication in the form of e-mail (electronic mail), text messages, and social updates. This has, in turn, led to a notable change in the way we communicate and perceive our own self efficacy to communicate and connect with others. With the ever-constant presence of “another word” in one’s pocket, in this global village world, individuals are multi-tasking both physically and cognitively as constant reminders of something

else happening somewhere else bombard them. Fear of being criticized is a major factor that prevents good communication in this technological age. No doubt, if we exercise constant simple practices to improve our communication skills, we can become effective communicators. This leads us to the next concept, technology.

Concept of Technology

In the words of Grant (2018), the term technology originated from two Greek words; techne and logia. The Greek according to Rex used the term to denote arts, skill or cunning of hands. Hence technology was used to refer to the collection of techniques, skills methods and processes used in the production of goods and services or in the accomplishment of objectives, such as scientific investigation. It can simply be referred to the science of craft. The knowledge of techniques, processes, etc can be referred to as technology. Similarly, technology can be embedded in machines, computers, devices and factories, which can be operated by individuals without detailed knowledge of the workings of such things. Plum (2017) traced the origin of man's use of technology to the beginning of attempts to convert natural resources into simple tools. The prehistoric discovery of how to control fire and the later Neolithic revolution increased the available sources of food and the invention of the wheel helped humans to travel in and control their environment.

Developments in historic times, including the printing press, the telephone, and the internet, have lessened physical barriers to communication and allowed humans to interact freely on a global scale. The steady progress of military technology has brought weapons of ever-increasing destructive power, from clubs to nuclear weapons. According to Samuelson (2018) the use of the term technology has changed significantly over the last 200 years. Before the 20th century, the term was uncommon in English, and usually referred to the description or study of the useful arts. The term was often connected to technical education, as in the Massachusetts institute of technology (chartered in 1861). The term technology rose to prominence in the 20th century in connection with the second

industrial revolution. Samuelson narrated that the term changed in the early 20th century when American social scientists, beginning with Thorstein Veblen, translated ideas from the German concept of Technik into technology.

Additionally, Tiz (2021) narrated that in German and other European languages, a distinction exists between Technik and technology that is absent in English, which usually translates both terms as technology. By the 1930s, technology referred not only to the study of the industrial arts but to the industrial arts themselves. According to Tiz, in 1937, the American Sociologist Read Bain wrote that technology includes all tools machines, utensils, weapons, instrument, housing, clothing, communicating and transporting devices and the skills by which we produce and use them. Bain's definition remains common among scholars, especially social scientists.

But equally prominent is the definition of technology as applied science, especially among scientists and engineers, although most social scientists who study technology reject this definition, more recently, scholars have borrowed from European philosophers of technique to extend the meaning of technology to various forms of instrumental reason, as in Foucault's work on technologies of the self (techniques de soi). Kuntu (2018) defined the term technology as the practical application of knowledge especially in a particular area" and a capability given by practical application of knowledge. Kuntu further gave another definition of the concept; it is practice, the way we do things around here, the term is often used to imply a specific field of technology, or to refer to high technology or just consumer electronics, rather than technology as a whole. Hung (2017) defined technology in two ways: as the pursuit of life by means other than life, and as organized inorganic matter.

According to Hung, technology can be most broadly defined as the entities, both material and immaterial, created by the application of mental and physical effort in order to achieve some value. In this usage, technology refers to tools and machines that may be used to solve real-world problems. It is a far-reaching term that may include simple tools, such as a crowbar wooden spoon, or more complex machines, such as a space station or particle

accelerator. Tools and machines need not be material; virtual technology such as computer software and business methods fall under this definition of technology. Similarly, Lee (2014) gave another broad definition of technology as a means to fulfill a human purpose. According to Lee, the word technology can also be used to refer to a collection of techniques. In this context, it is the current state of humanity's knowledge of how to combine resources to produce desired products, to solve problems, fulfill needs, or satisfy wants it includes technical methods, skills, processes, techniques, tools and raw materials.

When combined with another term, such as medical technology, communication technology or information and communication technology, it refers to the state of the respective field's knowledge and tools. From the foregoing, technology can be viewed as the activity that forms or changes culture. Additionally, technology is the appreciation of math, science, and the arts for the benefit of life as it is known. A modern example is the rise of communication technology, which has lessened barriers to human interaction and as a result, has helped spawn new subcultures: the rise of cyber culture has at its basis, the development of the internet and the computer. However, not all technology enhances culture in a creative way; technology can also help facilitate political oppression and war via tools such as guns. As a cultural activity, technology predates both science and engineering, each of which formalize some aspects of technological endeavor, (Lee, 2014).

Technology has many effects. It has helped develop more advanced economies (including today's global economy) and has allowed the rise of a leisure class. Many technological processes produce unwanted by-products, known as pollution, and deplete natural resources, to the detriment of Earth's environment. Various implementations of technology influence the values of a society and new technology often raises new ethical questions, examples include the rise of the notion of efficiency in terms of human productivity a term originally applied only to machines, and the challenge of traditional norms, (Rex, 2022). Philosophical debates have arisen over the use of technology, with disagreements over whether technology improves the human condition or worsens it.

According to Kuntu (2018), Neo-Luddism, Anarcho-primitivism, and similar reactionary movements criticize the pervasiveness of technology in the modern world, arguing that it harms the environment and alienates people; proponents of ideologies such as trans humanism and techno-progressivism view continued technological progress as beneficial to society and the human condition.

Obviously, technology has had a profound impact on what it means to be social. Society is likely on the cusp of a social revolution, during which it will be important to redefine socially appropriate and acceptable Behaviour (with regard to digital or virtual interaction). We are at a point in history where very few people have given critical thought to new social realities created by technology and what those realities mean to the individual and society. This further justifies the rationale for this study which is on principals' application of information and communication technology for personnel management practices in secondary schools. The next section is devoted to the concept of information and communication technology.

Concept of Information and Communication Technology

In attempt to give the etymology of the phrase information and communication technology (ICT), Grant (2018) stated that the phrase information and communication technology has been used by academic researchers since the 1980s, and the abbreviation ICT became popular after it was used in a report to the UK government by Dennis Steveson in 1997, and in the revised National curriculum for England, Wales and Northern Ireland in 2000. But in 2012, the Royal society recommended that ICT should no longer be used in British schools as it has attracted too many negative connotation and with effect from 2014 the British National Curriculum uses the word computer which reflects the addition of computer programming into the curriculum.

Variations of the phrase have spread worldwide, with the united nation's creating United Nations information and communication technologies task force and an internal office of information and communications technology. Iguma (2011) held

that Information and Communication Technology (ICT) is an extended term for information technology (ICT) which stresses the role of unified communications and the integration of telecommunications (Telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information. According to Uji (2019), the term ICT also refers to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the telephone network with the computer network system using a single unified system of cabling, signal distribution and management.

However, ICT has no universal definition as the concepts; methods and application involved in ICT are constantly evolving on an almost daily basis. To Plum (2017), the broadness of ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form, eg. Personal computers, digital television, email, robots. For clarity, zuppo provided an ICT hierarchy where all levels of the hierarchy contain some degree of commonality in that they are related to technologies that facilitate the transfer electronically mediated communications. Samuelson gave another definition of ICT as systems or technologies for processing information in text, data image and voice form and extends to international telecommunication network. Ali (2004) in Adeleke (2021) described ICT as the use of scientific tools and techniques for developing, documenting and communicating information when needed especially as they concern solving problems or providing needed services in the various areas of human endeavor.

Information and communication technology is also seen as a product of information revolution. Thus, ICT is the application of science to information handling. It consist of the hardware, software, processing, transmission and presentation of information (voice, data, text images) as well as related services. In modern society ICT is ever-present, with over three billion people having access to the

internet. With approximately 8 out of 10 internet users owning a smart phone, information and data are increasing by leaps and bounds, (Kuntu, 2018). This rapid growth, especially in developing countries, has led ICT to become a keystone of everyday life, in which life without some facet of technology renders most of clerical, work and routine task dysfunctional. According to Clerk (2021). Authoritative data released in 2014, shows that internet use continues to grow steadily at 6.6% globally in 2014 (3.3% in developed countries, 8.7% in the developing world); the number of internet users in developing countries has doubled in five years (2009-2014), with two thirds of all people online now living in the developing world.

However, hurdles are still at large of the 4.3 billion people not yet using the internet, 90% live in developing countries. In the world's 42 least connected countries (LCCs), which are home to 2.5 billion people, access to ICT remains largely out of reach, particularly for these countries' large rural populations, (Clerk, 2021). ICT has yet to penetrate the remote areas of some countries, with many developing countries dearth of any type of internet. This also includes the availability of cellular coverage, and other forms of electronic transmission of data. The increase in the aforementioned cellular data coverage, according to Clerk (2021), is Ostensible as many users have multiple subscriptions, with global growth figures sometimes translating into little real improvement in the level of connectivity of those at the very bottom of the pyramid; as estimated 450 billion people worldwide live in places which are still out of reach of mobile cellular service.

Favorably, the gap between the access to the internet and mobile coverage has decreased substantially in the last fifteen years, in which 2015 is the deadline for achievement of the united Nation millennium development goals; (MDGs), which global leaders agreed upon in the year 2000. ICT continues to take a new form, with nano technology set to usher in a new wave of ICT electronics and gadgets. ICT nearest editions into the modern electronic world include smart watches, smart wristbands, smart phones and smart TVS. With desktops soon becoming part of a bygone era, and laptops becoming the preferred method of computing, ICT

continues to insinuate and alter itself in the ever-changing globe. Information communication technologists play a role in facilitating accelerated pluralism in new social movements today. Lee (2014) observed that the internet is accelerating the process of issue group formation and action and coined the term accelerated pluralism to explain these new phenomena. ICTs in the word of Lee, are tools for enabling social movement leaders and empowering even dictators in affecting promoting societal change.

Concept of Information and Communication Technology Competencies

Web-Based Research Competencies

The word "re-search" means "to search again" with a view to rediscovering better ways of improving the existing situation. Human beings possess the vital instinct of inquisitiveness especially when the unknown confronts them. Their inquisitiveness makes them probe and attain full and fuller understanding of the unknown. This inquisitiveness is the mother of all knowledge and the method, which man employs for obtaining the knowledge of whatever the unknown, can be termed as research. Research is an academic activity and as such the term should be used in a technical sense. Web-based research is a careful online study of a subject, especially in order to discover new facts or information about it. Web-based research also be called cloud-based research, online research or research on the internet. According to Adelabu (2018), when web-based research is annexed with "development," it means an industrial work process that tries to identify new products and processes or to improve existing products or procedures online.

Web-based research is simply the process of arriving at dependable solutions to problems through planned and systematic collection, analysis and interpretation of data using the internet. Batagarwa (2019), defined web-based research as any organized online enquiry that aims at providing information for solving identified problem. All these definitions present web-based research as a human activity and a veritable tool for advancing knowledge for promoting progress, and for enabling man to relate more effectively to his environment, to accomplish his purposes, and to

resolve his conflicts. Hence, web-based research is a human activity on the web which is oriented toward the discovery of the relationships that exist among the observable issues or phenomena in the social environment in which we live. Web-based Research should be result-oriented by way of discovering new ideas or methods or replicating existing research with a view to affirm its validity.

Web-based research is a "systematized effort to gain new knowledge through online activities." It is actually a voyage of discovery. According to Egba (2020) web-based research comprises online defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusion; and at last, carefully testing the conclusion to determine whether they fit the formulated hypotheses. Web-based research is the internet-based manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art. Web-based research according to Wilson (2021) is an original contribution to the existing stock of knowledge making for its advancement on the web. It is an online pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for knowledge through objective and systematic method of finding solution to a problem is research.

An internet based systematic approach concerning generalization and the formulation of a theory is also web-based research. As such, web-based research refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solution(s) towards the concerned problem or in certain generalization for some theoretical formulation online. Nelson listed online research competencies to include; key word identification competencies, internet browsing competencies, brainstorming competencies, lateral-thinking competencies, reduction competencies and analytical competencies while Batagarwa identified downloading, printing webpage, saving, webpage retrieval, short-cut operations,

webpage sharing, web link saving and web link sharing as main web-based research competencies

Digital Data Processing Competencies

Digitalization and technological development have radically changed how people think, behave, communicate and work. In education, the advent of technology in the 21st Century has brought changes in the learning environments and, consequently, the learner. Globally, digital transformation has brought significant educational changes, especially in curricula development and teaching methods. In the teaching-learning environment, technology provides opportunities for teachers and students to fit in the globalized digital age, (Dennis, 2022). Digital competence, as defined by Nelson (2018), refers to the confident, critical, and responsible use of digital technologies for learning, work, and participation in society. This encompasses a combination of knowledge, skills, and attitudes across five key areas: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving.

For teacher educators, these competencies translate into designing and delivering digitally enriched lessons, facilitating collaborative online learning, critically evaluating digital resources, and fostering a safe, inclusive digital learning environment (Punie & Redecker, 2017). The Tachy (2019) further organizes digital competencies into six areas: professional engagement, digital resources, teaching and learning, assessment, empowering learners, and facilitating learners' digital competence. This structured approach ensures that teacher educators are well equipped to integrate technology effectively, thereby enhancing the learning experience and fostering digitally literate future generations (Sapre, 2019). The integration of digital tools in teacher education presents numerous opportunities. Platforms such as Moodle, Google Classroom, and Zoom have revolutionized interactions between teacher educators and pre-service teachers, offering real-time feedback and diverse assessment methods. These tools promote personalized learning, interactive pedagogies, and global collaboration (Dayal, 2023). However, challenges persist, including

inadequate infrastructure, limited training opportunities, and resistance to change.

These barriers are particularly prevalent in developing countries like India, where inequities in access to technology often exacerbate the digital divide (Okeme, 2019). Moreover, deficiencies in digital competence among teacher educators can adversely impact student outcomes, emphasizing the need for targeted professional development (Gümüş & Kukul, 2023). The National Educational Policy (NEP) (2020) represents a transformative initiative aimed at overhauling India's educational framework to meet the demands of the 21st century. The policy underscores the imperative integration of technology across all educational levels, with a particular emphasis on enhancing teachers' capacities. NEP (2020) explicitly advocates for building capacity in digital competencies, highlighting the necessity for teacher educators to serve as exemplary models in the effective utilization of digital tools (Ministry of Education, 2020).

Central to this vision is the establishment of the National Educational Technology Forum (NETF), intended as a platform for the free exchange of innovative ideas and strategies to leverage technology for improved learning outcomes (National Educational Technology Forum, 2023). Moreover, the policy promotes the development and implementation of online teacher training modules, along with the incorporation of Information and Communication Technology (ICT) in pre-service teacher education curricula (Wilson, 2021). This comprehensive approach aims to foster a digitally competent teaching workforce capable of navigating and integrating advanced technological resources to enhance the educational experience and outcomes for students. Wilson (2021) listed digital data processing competencies to include; downloading, text review, reviewed text correction, page layout formatting, printing, spreadsheet operations, data presentations in tables, data presentation in charts, data presentation in pictograph, graph constructions, organizing, arranging, spreadsheet operations, editing, sorting and analyzing.

E-learning Competencies

E-learning, also referred to as online learning or electronic learning, is the acquisition of knowledge that takes place through electronic technologies and media, (Hank, 2022). In simple language, e-learning is defined as "learning that is enabled electronically." Typically, e-learning is conducted on the Internet, where students can access their learning materials online at any place and time. E-learning most often takes place in the form of online courses, online degrees, or online programs, (Kpei, 2022). E-learning unites two main areas, learning and technology. Learning is a cognitive process for achieving knowledge, and technology is an enabler of the learning process, (Shirley, 2021). According to Tahir (2020), E-Learning is an interactive learning system that provides the learner with the use of communication and information technologies and depends on an integrated digital electronic environment that displays courses across electronic networks, provides guidance and guidance, organizes tests as well as managing and evaluating resources and processes.

The importance of e-learning lies in solving the problem of the knowledge explosion and the increasing demand for education and expanding opportunities for admission to education, in addition to enabling training and education of workers without leaving their jobs and contributing to breaking psychological barriers between the teacher and the learner as well as satisfying the needs and characteristics of the learner while raising the return on investment by reducing the cost of education, (Nelson, 2018). It is one of the means that supports the educational process and its transformation from the stage of indoctrination to the stage of creativity, interaction and skill development and collects all electronic forms of teaching and learning, where the latest methods are used in the fields of teaching, publishing and entertainment by adopting computers, storage media and networks, (Itoya, 2020). The rapid transfers in the field of technology have led to the emergence of new patterns of learning and education, which have further entrenched the concept of individual or self-education, whereby the learner continues his learning according to his energy, ability and speed of his learning according to his previous experiences and skills, (Olusola, 2021).

E-learning is one of these evolving patterns of so-called distance learning in general, and computer-based education in particular. E-learning mainly relies on computers and networks for transferring knowledge and skills. Its applications include online learning, computer learning, virtual classrooms and digital collaboration, (Hamitton, 2021). There are many terms used to describe learning that is delivered online, via the internet, ranging from Distance Education, to computerized electronic learning, online learning, internet learning and many others, (Okeme, 2019). The importance of e-learning lies in solving the problem of the knowledge explosion and the increasing demand for education and expanding opportunities for admission to education, in addition to enabling training and education of workers without leaving their jobs and contributing to breaking psychological barriers between the teacher and the learner as well as satisfying the needs and characteristics of the learner while raising the return on investment by reducing the cost of education, (Sapre, 2019).

The impact of the electronically connected world on the learning and training of individuals and organizations is the primary revolution in Education. The 21st century is Globalization and Telematics (computers connected to networks). They denote the emergence of new global cultural forms, media, technologies of communication and most significantly, the Telematics revolution (Wilson, 2021). The effects of e-Learning on the training profession are revolutionary, challenging most of its basic tenets. The change comes from outside influences: new players in other disciplines, forces in the supplier market, and the kind of learning that technology is increasingly making possible. Using interactive technologies can bring huge benefits to the way we teach and learn.

All learners, from pre- school to lifelong learning, can benefit from mixing these new technologies with other forms of study. Dennis (2022) listed E-learning competencies to include; zoom meeting scheduling, shearing screen on zoom, video expressions on zoom, muting options on zoom, meeting calendar creation on zoom, zoom meeting cancelation, Whats'app voice call conference meeting, whatsapp video call conference meeting, online text review, online editing of reviewed texts, Google meet

scheduling, shearing screen on Google meet, video expressions on Google meet, muting options on Google meet, meeting calendar creation on Google meet, Google meet cancelation, e-mail sending, e-mail forwarding, e-mail downloading, shearing screen on zoho, video expressions on zoho, muting options on zoho and meeting calendar creation on zoho.

Artificial Intelligence (AI) Utilization Competencies

AI, which stands for artificial intelligence, is a branch of computer science that develops machine systems capable of demonstrating behaviors linked to human intelligence, (Kpei, 2022). AI programs use data collected from different interactions to improve the way they mimic humans in order to perform tasks such as learning, planning, knowledge representation, perception and problem-solving, (Shirley, 2021). Artificial intelligence technology is used for a wide range of applications, including in web development, such as automated chatbots for customer service, product recommendations based on a user's habits, speech recognition, and even to build a website from scratch, (Hank, 2022). Essentially, the purpose of AI is to improve the systems we already use by automating tasks to make them more efficient.

The application of Artificial Intelligence (AI) technology in education is increasingly recognized as a key driver of educational innovation. While extensive literature exists on the integration of AI technologies in educational settings, less emphasis has been placed on the critical role of teachers and their professional development needs, (Dennis, 2022). Since 2022, generative Artificial Intelligence (AI) technologies, exemplified by ChatGPT, have rapidly matured and shown significant potential in various downstream tasks (Ben and Lin, 2024). These technological advancements have catalyzed a growing interest in integrating earlier AI innovations from fields such as natural language processing and computer vision into educational settings, making AI in education a prominent research area (Mai, 2023).

Scholars have increasingly explored how these AI technologies can enhance the teaching and learning process through tools such as chatbots, AI-assisted learning platforms, data-driven

decision support systems, and learning behavior analysis tools, among others (Tang, 2023). The potential for AI to revolutionize teaching is being actively examined across the education sector. However, this trend is not without controversy. Concerns have been raised about the possibility of AI to diminish the role of teachers, compromise educational quality, or adversely impact students' cognitive development (Tachy, 2019). Despite these concerns, the academic community remains focused on exploring the potential applications and benefits of AI tools in teaching practices.

Prior to the emergence of generative AI, the application of AI in education was largely confined to supporting teaching and assessment tasks, such as intelligent learning systems and automatic scoring tools (Wang, 2021). Baker (2019) highlighted the extensive use of AI tools in education, emphasizing its service to three primary stakeholder groups: learners, teachers, and educational administrators. Intelligent learning systems, such as CENTURY, have been beneficial for students, enabling self-paced learning and customizing learning materials to align with individual interests. Similarly, intelligent instructional management software, like Class-Charts, has supported teachers by reducing administrative burdens, providing deeper insights into student performance, and fostering innovative classroom practices, (Okeme, 2019). Moreover, certain AI applications, such as supervised machine learning-based school evaluation systems, have aided school administrators in decision-making and information management.

While these tools have enhanced teaching and learning processes, their functionalities and applications were relatively narrow in scope. Prior research indicates that early AI systems were limited in their ability to assess complex cognitive performance and generate personalized learning content (Zack, 2019). With the rapid development of generative AI technologies, particularly the emergence of the applications based on large language models, the field of education is witnessing unprecedented opportunities for innovation. These AI tools are not only adept at generating text and images but are also capable of handling complex tasks such as programming and creative writing (Danny, 2024). This progress significantly expands the scope of AI applications in education,

offering enhanced flexibility and efficiency in content creation and personalized learning pathway development.

For teachers, generative AI technologies not only enrich the learning experience but also increase teaching efficiency, enabling them to dedicate more time to instructional innovation and student interaction (Kisha, 2023). Kisha listed Artificial intelligence (AI) utilization competencies to include; educational chat bots, adaptive learning platforms, Ai-powered tutoring systems, automated writing assessment, natural language processing tools, reactive machines limited memory, narrow AI, General AI, theory of mind and self-aware and natural language processing tools.

Educational Social Media Utilization Competencies

Social media in education describes the use of social media websites in school, as well as other online communication tools for educational purposes. This includes leveraging platforms like Facebook, Instagram, TikTok, YouTube, LinkedIn to facilitate learning through social media, collaboration and engagement among students, educators, and other members in the education community, (Wilson, 2021). It's no secret that bringing social media and education together is risky business. Social media is often seen as a distraction for students, which can lead to a loss of productivity, followed by a decline in academic performance, (Olusola, 2021). Using social media for learning is a smart strategy that comes with a ton of benefits for the education industry. On the other hand, social media for educators means that they have a much better chance of speaking their students' language and improving their teaching experience, (Shirley, 2021).

Social media comes with a lot of challenges, and it is important to be able to overlook them and focus on the importance of social media in learning in order to make the education system better for everyone involved. Only then will one be able to unlock and enjoy the educational benefits of social media, (Dennis, 2022). Dennis listed the top benefits of social media in education to include:

- **Connects students and educators:** Social media's biggest merit when it comes to the education sector is that it connects

students and educators in a way that was not possible before. Students can build a much more informal and close rapport with their teachers through social media conversations, sharing opinions, ideas and resources back and forth. This type of media channel helps humanize educators in the eyes of students.

- **Boosts engagement:** At every level, educators are searching for new ways to capture and hold their students' attention and get them involved in what is being taught. Well, social media might be the solution everybody has been waiting for. That's because social media as a marketing channel is very engaging.
- **Promotes accessibility:** Educational institutions can reach more potential students through social media, give them better access to essential information and as a result, encourage more of them to enroll in their school. Universities in particular strategically use social media for marketing to attract prospective students and engage current ones. What's more, social media can facilitate the distribution of school materials and even lectures. Everybody, regardless of their location, can access valuable resources that would otherwise be limited to a single geographical location.
- **Creates professional opportunities:** social media enables students to get in touch with key people in relevant industries and start building their professional network long before they graduate. Through this channel, students can fast-track their academic and personal growth by engaging in meaningful conversations and reaching out to mentors for assistance and advice.

Kpei (2022) listed educational social media utilization competencies to include; Telegram, YouTube, Reddit, Messenger, Tumblr, Discord, Twitch, Whatsapp, Skype, X, Facebook, We-chart, Sharechat, Instagram, Printerest, Weibo, Threads, LinkedIn, Quora, Line, TikTok and Snapchat.

University Education

University education also known as higher education or tertiary education refers to the advanced level beyond the primary and secondary levels. It typically includes education provided by universities, colleges, professional schools, and other institutions that offer specialized academic and vocational programs, (Dunga, 2018). Dunga asserted further that university education focuses on in-depth learning in specific fields of study, enabling individuals to develop expertise and advanced knowledge in their chosen areas. At the university education level, students pursue undergraduate and graduate degrees, such as Bachelor's, Master's, and Doctorate degrees, depending on their academic and career aspirations. The curriculum is more specialized and research-oriented than earlier education stages, encouraging critical thinking, analytical skills, and independent research, (Lee, 2020).

University education according to Egba (2020) serves various purposes, including:

- **Specialization:** It allows students to focus on their areas of interest and expertise, preparing them for careers in specific industries or professions.
- **Research and Innovation:** Universities are centers of research and development, contributing to the advancement of knowledge and the development of new technologies, ideas, and solutions.
- **Personal Growth:** Beyond academic knowledge, higher education fosters personal development, character building, and a sense of social responsibility.
- **Career Advancement:** University equips individuals with the necessary skills and qualifications to pursue higher-level positions and leadership roles in their fields.
- **Lifelong Learning:** It instills a love for learning beyond graduation, encouraging continuous education and personal growth.

University education is a key driver of societal progress and economic development. Nations with well-developed university

education systems tend to have a more skilled and innovative workforce, contributing to overall prosperity and competitiveness in the global market. It plays a crucial role in shaping the future of individuals and society, empowering learners to become responsible and contributing members of their communities, (Tahir, 2020). University education is a bastion of academic excellence, fostering critical thinking, innovation, and research that push the boundaries of human knowledge. Beyond specialization and career preparation, it seeks to nurture holistic personal development, cultivating ethical values, leadership qualities, and a global perspective, (Adogo, 2021). University education empowers individuals to adapt to evolving challenges, contribute meaningfully to their communities, and champion progress in a rapidly changing world by instilling a love for lifelong learning.

The objectives of university education according to Okeme (2019) encompass a wide range of goals that aim to fulfill various roles in individuals' personal, academic, and societal development. Okeme listed the objectives to include:

- **Academic Excellence:** One of the primary objectives of the university is to provide rigorous and comprehensive academic programs that promote excellence in learning. Universities strive to maintain high education standards and ensure that students understand their chosen disciplines deeply.
- **Specialization:** Universities allows students to specialize in specific fields of study, enabling them to acquire advanced knowledge and expertise in their areas of interest. The specialization prepares individuals for specialized careers and positions in their respective industries.
- **Critical Thinking and Problem-Solving:** Universities fosters critical thinking skills, encouraging students to analyze and evaluate information critically. It cultivates problem-solving abilities that empower graduates to address complex challenges in their professional and personal lives.
- **Research and Innovation:** Universities are hubs of research and innovation. Encouraging students and faculty to engage in research contributes to advancing knowledge, technological

breakthroughs, and developing solutions to real-world problems.

- **Personal Development:** Universities aim to nurture holistic personal growth in students. It focuses on character building, ethical values, leadership qualities, and a sense of social responsibility, preparing individuals to be responsible and compassionate citizens.
- **Global Awareness and Cultural Understanding:** Universities encourages exposure to diverse perspectives, cultures, and ideas. Promoting global awareness and cultural understanding helps students develop a more inclusive and open-minded worldview.
- **Lifelong Learning:** Instilling a love for learning that extends beyond graduation is an essential objective of higher education. Graduates are encouraged to embrace lifelong learning to adapt to changing circumstances, pursue professional development, and stay relevant in a rapidly evolving world.
- **Employment and Career Preparation:** Universities equips students with the skills and qualifications to enter the workforce and pursue successful careers. It provides internships, practical experiences, and networking opportunities, enhancing graduates' employability.
- **Social and Economic Mobility:** Universities has the potential to uplift individuals from disadvantaged backgrounds, providing opportunities for social and economic mobility. It can break barriers and open doors to better opportunities and improved quality of life.
- **Contribution to Society:** A significant objective of universities is to foster a sense of civic responsibility and encourage graduates to contribute positively to their communities. Higher education is crucial in producing responsible and active citizens committed to making a difference in society.

University education aims to empower individuals with the knowledge, skills, and values needed to lead fulfilling lives, positively impact society, and advance knowledge and human

progress by pursuing these objectives. University education serves as a transformative journey that prepares individuals for the challenges and opportunities of the future.

Educational Technology

Educational technology (commonly abbreviated as edutech, or edtech) is the combined use of computer hardware, software, and educational theory and practice to facilitate learning and teaching, (Hanks, 2022). When referred to with its abbreviation, "EdTech", it often refers to the industry of companies that create educational technology. In addition to the practical educational experience, educational technology is based on theoretical knowledge from various disciplines such as communication, education, psychology, sociology, artificial intelligence, and computer science, (Brown, 2020). It encompasses several domains including learning theory, computer-based training, online learning, and m-learning where mobile technologies are used. Kpei, (2022) defined educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources".

It denotes instructional technology as "the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning", (Nelson, 2018). As such, educational technology refers to all valid and reliable applied education sciences, such as equipment, as well as processes and procedures that are derived from scientific research, and in a given context may refer to theoretical, algorithmic or heuristic processes: it does not necessarily imply physical technology, (Audu, 2018). Educational technology is the process of integrating technology into education in a positive manner that promotes a more diverse learning environment and a way for students to learn how to use technology as well as their common assignments, (Dunga, 2018).

Educational technology is an inclusive term for both the material tools and processes, and the theoretical foundations for supporting learning and teaching. Educational technology is not restricted to advanced technology but is anything that enhances

classroom learning in the utilization of blended, face-to-face, or online learning, (Tachy, 2019). An educational technologist is someone who is trained in the field of educational technology. Educational technologists try to analyze, design, develop, implement, and evaluate processes and tools to enhance learning, (Okeme, 2019). Modern electronic educational technology is an important part of society today.

Educational technology encompasses e-learning, instructional technology, information and communication technology (ICT) in education, edtech, learning technology, multimedia learning, technology-enhanced learning (TEL), computer-based instruction (CBI), computer managed instruction, computer-based training (CBT), computer-assisted instruction or computer-aided instruction (CAI), internet-based training (IBT), flexible learning, web-based training (WBT), online education, digital educational collaboration, distributed learning, computer-mediated communication, cyber-learning, and multi-modal instruction, virtual education, personal learning environments, networked learning, virtual learning environments (VLE) (which are also called learning platforms), m-learning, and digital education, (Itoya, 2020). Each of these numerous terms has had its advocates, who point up potential distinctive features.

Educational content, pervasively embedded in objects, is all around the learner, who may not even be conscious of the learning process, (Brown, 2020). The combination of adaptive learning, using an individualized interface and materials, which accommodate to an individual, who thus receives personally differentiated instruction, with ubiquitous access to digital resources and learning opportunities in a range of places and at various times, has been termed smart learning, (Wilson, 2021). Smart learning is a component of the smart city concept.

Effective Teaching and Learning of Educational Technology

In today's day and age, technology has incorporated itself into every aspect of our lives, including the education field. It is a tool that helps us complete complex tasks quickly and efficiently, (Hanks, 2022). However, it is necessary to keep in mind that

technology is a tool for education, but it can't solve the problems itself. The usefulness of educational technology lies in what educators do with it and how they use it to best meet the needs of their students. The appropriate use of digital learning tools in schools can boost student engagement, assist teachers in improving lesson plans, and enable personalized learning. It also helps students to develop critical thinking skills, (Adogo, 2021). The influence of technology can be seen in every area of our lives; however, the impact of technology on education has been the most noticeable in recent years.

Schools are incorporating more and more technology into the classroom to keep up with technological advances in hopes of preparing students for the rapidly changing world of technology. It has also become pivotal in helping teachers develop their teaching classes based on student's learning styles, (Tahir, 2020). One of the most significant benefits of using technology in education is putting students' knowledge and skills into action. Students earn beneficial knowledge through online classes and interactions with their teachers and other peer students. However, it is very important to put these new skills into practice and action, (Adelabu, 2018). Technology enables students to put their earned knowledge into practice through different applications. The incorporation of technology into the classroom helps teachers to easily assign various tasks and assignments that allow students to put their knowledge and experience into action and develop the ability to apply their knowledge to create a solution to a situation, problem, or event, (Lee, 2020).

Technology if taught properly, will have an impact on students' critical thinking skills depending on a variety of elements, including the type of technology used and the context in which it is used, (Dennis, 2022). It is a well-known fact that the use of technology in the classroom can make activities and the learning process more engaging. Technology has the ability to engage multiple senses and can increase students' investment in the material. Appropriate classroom technology boosts students' academic achievement, self-confidence, motivation in class, and attendance. Technology facilitates students' transition from sitting

attentively and listening to more hands-on learning. In addition, technology influences critical thinking by assisting students in applying what they've learned to real-life situations and developing problem-solving skills, both of which are essential components of critical thinking, (Hanks, 2022).

Expanding skillset with hectic schedules and demanding lifestyles as become difficult and very critical. This is where technology comes in. Education is more convenient than ever, with virtual lessons gradually replacing traditional lectures. Students can plan their time and learn at a convenient time for them. They can also pursue subjects and courses outside of their course curriculum to broaden their knowledge, (Audu, 2018). Technology enables continuous access to information and knowledge. Classes can be completed entirely online using a laptop or mobile device. Learning that is hybrid combines the use of technology from almost anywhere with regular in-person classroom sessions. It is possible to use technology to tailor learning plans for each student in both scenarios. Lessons can be designed based on student interests and strengths, (Lee, 2020).

Another advantage is that students can learn at their own pace. Students can rewatch videos in the lesson plan when they need to review class material to better understand key concepts. In addition, teachers can use the data generated by these online activities to see which students struggled with certain subjects and offer extra help and support, (Tachy, 2019). A very important technological impact on education is increased interactivity and class engagement. In addition, better overall comprehension, practical learning, time management, and combined learning methodologies are just some of the impacts that technology has had on student learning.

Gender Influence

Gender is an important variable in current researches in the field or education. In most states, female gender has imposing population in teaching profession. Akan (2018) asserted that gender refers to the socially, culturally constructed characteristics and roles which are ascribed to males and females in any society. Gender is a

major factor that influences the students' behavior including career choice and subject interest of the student. According to Udida (2020), gender or sex refers to those characteristics of males and females which are biologically determined such as possession of the male and female reproductive genital organs. Udida further gave a broad analytical concept which draws out female role/responsibilities in relation to those of males describing the males attribute as bold, aggressive, tackful economical use of words, while females are fearful, timid, gentle, dull, submissive and talkative. Modo (2018) alleged that in schools, males are more likely to take difficult subjects areas like sciences, while the females take to careers that will not conflict with marriage chances, marriage responsibilities and motherhood and this may influence their study behavior.

Evidently, lecturers also, encourage gender stereotype by giving different treatment to males and females. Teachers go further to give different career guidance to males and females. The society frowns at seeing a man cooking or a female climbing a tree. Nigeria, since she gained her independence had never produced a female President. To correct this abnormally, it is expected that the leading experiences offered to the children in schools should not discriminate against males and females. Gender discrimination cut across almost every sphere of lives of citizens of developing nations such as Nigeria. Thus, the male genders are expected to play certain role different to the females as a result of the societal and cultural perception of the different genders. Okoroafor (2017), argued that cultures interpret and elaborate these inherit differences into a set of social expectation about what behaviour and activities are appropriate for them and what right, resources and even power they possess. This means that there are differences in learning between males and females.

Gender is a major factor that influences career choice and subject interest of lecturers and student alike. Gender may also influence an individual perception or opinion. With respect to Information and Communication Technology competencies needed for effective teaching and learning of Educational Technology course in universities, earlier researchers made conflicting findings

on the perceptions of male and female lecturers and students. For instance, Olusola (2021) and Kpei (2022) reported in their separate studies that female respondents strongly supported the need for ICT competencies to facilitate effective teaching and learning of Educational Technology course in universities while their male counterparts did otherwise.

On the other hand, Sapre (2019) and Hanks (2022) found in their separate studies that male respondent strongly supported the need for ICT competencies to facilitate effective teaching and learning of Educational Technology course in universities unlike their female counterparts. Whereas, ogbonna (2019) and Shirley (2021) in their separate studies, reported that male and female respondent did not differ significantly in their views on ICT competencies needed for effective teaching and learning of Educational Technology course in universities. Once more, this no definitive conclusion status can only be resolved by a study such as this present one which aims at determining the ICT competencies needed for effective teaching and learning of Educational Technology course in universities.

CHAPTER 3

Topic:

STUDY SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED ACADEMIC PERFORMANCE IN COMPUTER STUDIES IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Study skills

To discuss the concept of study skills it is expedient that one starts with the concept of skills. A skill as defined by Jumoh (2023) is the learned or innate ability to act with determined results with good execution often within a given amount of time, energy, or both. Skills can often] be divided into domain-general and domain-specific skills. Some examples of general skills include time management, concentration, teamwork and leadership, and self-motivation. In contrast, domain-specific skills would be used only for a certain job, e.g. operating a sand blaster. Skill usually requires certain environmental stimuli and situations to assess the level of skill being shown and used, (Abiodun, 2021). Study skills or study strategies according to Maris (2021) are approaches applied to learning. Study skills are an array of skills which tackle the process of organizing and taking in new information, retaining information, or dealing with assessments. They are discrete techniques that can be learned, usually in a short time, and applied to all or most fields of study, (Adam, 2018). More broadly, any skill which boosts a person's ability to study, retain and recall information which assists in and passing exams can be termed a study skill, and this could include time management and motivational techniques.

The term skill is used mainly to refer to a level of individual performance, in the sense of accuracy and speed in performing

particular tasks, or qualities required for successful performance in particular jobs and tasks, (Tinks, 2021). Economists and educational psychologists tend to use the concept of skill in the first sense: to describe the abilities acquired by an individual such as a worker, which may include cognitive skills, manual dexterity, knowledge, and social skills. These researchers often take skill as an independent variable and use it, for example, in predicting wage levels, (Raphael, 2018). In sociology, on the contrary, skills are often taken as qualities required of a particular job, in terms of the range and complexity of the tasks involved, level of discretion over work and time, and the knowledge and training needed to learn the job. Many sociologists thus view skill as a dependent variable and try to explain variations in the level of skill within occupations, economies, and/or over time. For analysis of changing skills levels over time, the historical example of craft workers often stands as a benchmark, (Eje, 2019).

Although skill has always been a somewhat ambiguous and rarely precisely defined term, in the past it had a much narrower meaning than today. It tended to be equated with craft, technical know-how, and manual dexterity. Gradually, however, the importance of mental qualities was acknowledged and motor skills and cognitive skills were distinguished. While motor skills require voluntary body movement to achieve a goal, cognitive skills do not involve muscular movement and involve activities such as problem solving, memory, or reading (Dandutse, 2020). More recently, the concept of skill was further broadened. In addition to "hard skills" (both motor and cognitive), the importance of "soft skills" was underlined. They include effective communication, creativity, flexibility, change readiness, leadership, team building, and so on, (Rex, 2019). Much discussion has also been given to the distinction between "generic" (also "transferable" or "key") skills on the one hand and occupational or job-specific skills on the other. While occupation-specific skills have value only in one particular sector or industry, generic skills have value in a number of sectors, (Pwag, 2020). The tendency to re-label as skills personal traits and attitudes and to term many concrete and abstract human dispositions as "skills" further broadened and blurred the concept.

In social theories, the concept of skill is usually linked to the labor market, education, and technology. Authors, however, differ fundamentally on the role skills are supposed to play. The origins of the skill concept are often connected with Karl Marx. The dominant interpretation of Marx's work suggests that capitalists, through mechanization of labor and the manufacturing system, reduced skills requirement to increase productivity and profits and to increase control over workers and work organization, (Abel, 2024). This line of reasoning was followed in so-called de-skilling theory, assuming a process of job degradation. In sharp contrast, the thesis of post-industrial and/or knowledge societies posits a general upgrading of skills and stresses the growing importance of cognitive skills, (Jumoh, 2023). Human capital theory also stresses the importance of knowledge and skills to economic performance and assumes that employers adjust earnings to reflect both skills and educational attainment, (Okeke, 2023). Workers with scarce skills are supposed to obtain better-paid and more secure jobs than those without them, and skills and education are assumed to be highly correlated. In contrast, credential theory Walter (2020) views education as a biased indicator of skill and asserts that colleges function more as a rationing device in job allocation than as skills provider.

Educational credentials are supposed to be a much more important determiner of labor force reward than skill. Being successful in school requires a high level of study skills. Students must first learn these skills, practice them and develop effective study habits in order to be successful. Good study habits include many different skills. As listed by Abiodun (2021) the skills include; time management, self-discipline, concentration, memorization, organization, and effort. Tinks (2021) listed specific competences of effective study skills to include acquiring information, recording information, recording appropriate responses to the presented information, locating the required information, organizing and managing activities efficiently, synthesizing information to create meaningful patterns of responses and memorizing and retrieving information on demand. According to Abel (2024) good and effective study skills requires concentration, time management,

reading skills, preparing for examinations and note taking skills. Abel averred that these skills specifically apply to secondary school students. Hence, this study shall adopt the five skills postulated by Abel since the subjects of this study are secondary schools students. The skills are discussed below.

Reading Skills

Reading skills is defined as the process of interpreting written language, (Ndume, 2019). Abel (2024) stated that reading is the process of interpreting a symbol, a sign or a measuring device. Reading skill is a complex cognitive ability requiring the capability to integrate and interpret information. It is also an elaboration of mental representation. Reading activities are made to comprehend the academic materials and learn the conceptual framework. Reading to learn is an essential tool for life-long learning. Promoting a reading culture among students is therefore one of the key tasks in curriculum reform with the aim to strengthen students learning capability and academic performance, (Ogba, 2020).

Concentration Skills

Concentration as a study skill refers to the ability to focus one's thought or attention to his studies. It includes all techniques for shielding academic goal pursuit from unwanted distraction. Tinks (2021) stated that concentration skills include skills for paying attention in class, completing home work/assignment, studying and concentration during test. Study skills according to Jumoh (2023) is concerned with whether the students study with deep concentration, do not feel like studying, or day dream and lack memory power. Concentration is ability to overcome possible distractions that can impede academic goal attainment.

Note-Taking Skills

Maris (2021) defined note-taking as the practice of recording information captured from another source. Okeke (2023) posited that by taking notes, the writer records the essence of the information, freeing their mind from having to recall everything. Notes are commonly drawn from a transient source, such as an oral

discussion at a meeting, or a lecture. Note taking is a form of self-discipline. Akan (2020) submitted that note-taking habit is concerned with the way the students make note of points during reading, use dictionary, take down notes during the class and discuss with teachers for clarification of doubts. Akan explained that note-taking is a central aspect of a complex human behavior related to information management involving a range of underlying mental processes and their interactions with other cognitive functions. The person taking notes must acquire and filter the incoming sources, organize and restructure existing knowledge structures, comprehend and write down their interpretation of the information, and ultimately store and integrate the freshly processed material. The result is a knowledge representation, and a memory storage, (Adams, 2018).

Time Management Skills

Time management according to Ayo (2020) is the act or process of planning and exercising conscious control over the amount of time spent on specific activities, especially to increase effectiveness, efficiency or productivity. Eje (2019) added that time management is a meta-activity with the goal to maximize the overall benefit of a set of other activities within the boundary condition of a limited amount of time, as time itself cannot be managed because it is fixed. Time management may be aided by a range of skills, tools, and techniques used to manage time when accomplishing specific tasks, projects, and goals complying with a due date. According to Eje, initially, time management referred to just business or work activities, but eventually the term broadened to include personal activities as well. A time management system is a designed combination of processes, tools, techniques, and methods. Walter (2020) submitted that time management as a study skill, includes the use of reading time table to schedule or allocate time for every subject of study.

Preparing for Examination Skills

Raphael (2018) defined preparation as the process of getting ready for specific future purpose. Dandutse (2020) agreed with this

definition stating that to prepare is to set up or simply to make ready for something. Making preparation therefore involves skills that will boost the confidence of every student. This confidence will suppress all forms of nervousness and anxiety or the so called "Examination Fever", (Tinks, 2021). Ndume (2019) defined examination as a formal test involving answering written or oral questions with no or limited access to text books or the like. Ndume therefore averred that students as part of their study habits must prepare adequately for examinations.

From the foregoing it is obvious that secondary school students' study skills is a vital topic that should worry all well-meaning educators and researchers. This is because good study skills are viable academic skills, and effective study strategies. They are veritable approaches when applied to learning. They are generally critical to success in school, considered essential for acquiring good grades, and useful for learning throughout one's life. Good study skills are an array of aids which tackle the process of organizing and taking in new information, retaining information, or dealing with assessments. It is therefore worrisome that secondary school students study skills seem not to be satisfactory. Hence, this study is a deliberate attempt to determine secondary school students' study skills for improved academic performance in Enugu state.

Concept of Academic Performance

The term academic performance refers to how well a student does in school in academic matters. It also refers to how students deal with their studies and how they cope with or accomplish different tasks given to them by their teachers or other authorized person(s). In educational institutions, students' success is usually measured by their academic performance. Ayo (2022) posited that academic performance is simply the gain in knowledge of learners as a result of taking part in a learning activity, course of study or programme. Maris (2021) added that Academic performance generally suggests an achievement relating to education and scholarship. According to Maris, academic performance may depict pupils'/students' performance on a standard of measurement such as

performance test, skill test, analytical thinking test, quantitative reasoning, aptitude test, verbal aptitude, etc.

In addition, Ojunta (2019) stated that, for regular grading, students demonstrate their knowledge by taking written and oral tests, performing presentations, turning in homework and participating in class activities and discussions. Education has a set of goals/aims and objectives it sets out to achieve. These aims and objectives of education are achieved through teaching-learning process. The attainment or non-achievement of these educational goals are learning outcomes. These learning outcomes could be seen as academic achievement. According to Jack, (2021) this phenomenon (learning outcomes) has been variedly referred to in literature as academic achievement, or scholastic functioning. Students' academic achievement tends to show their level of competitiveness, creativity, efficiency and productivity both in present and future times.

Jack further asserted that while stressing on students' academic achievement in the educational system, opined that academic achievement of students especially at the secondary school level is not only a pointer to the effectiveness or otherwise of schools but a major determinant of the future of youths in particular and the nation in general. Students' academic achievement shows the success or otherwise of an academic/educational endeavor. Students' achievement appears to be the major decisive factor by which the success of any teaching-learning process could be judged. Buttressing this point, Pedro (2019), was of the view that academic achievement is a fundamental criterion by which all teaching-learning activities are measured, using some standards of excellence and the acquisition of particular grades in examinations to measure student's ability, mastery of the content, and skills in applying the knowledge acquired to a particular situation.

Virtually all education stake holders place high value on academic achievement, thus, excellent academic achievement of children is often the expectation of parents and other education stake holders, (Kuntu, 2020). Teachers may show students' academic performance by use of letters or number grades, remarks and side notes to describe how well a student has done. Dandutse (2020)

viewed academic performance as a basic process of adopting and improving the quality and progress of students' scholarly endowments. According to Dandutse, what is learned can be measured either by those things that have been observed in the behaviour of the individual or those that can be inferred. Academic performance is a multifaceted construct that comprises different domains of learning. Based on this, the definition of the concept varies among educators, policy makers and other stakeholders in education. Pwag (2020) opined that educational/academic performance is seen as performance outcome that indicate the extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in school, colleges and university. Pwajeng further described academic performance as the outcome of education, the extent to which a student, teacher, institution have achieved their educational goals.

Consequently, academic performance shows the level of schooling one have successfully completed and the ability of one to attain success in one's studies. Zahra (2021) in a thorough overview of the assessment of academic performance argued that standardized performance tests are perhaps the most reliable indicators of academic performance since they provide more objective rating of academic performance than mere grades. Secondary school students' academic performance is a very vital variable in educational research for many reasons. Foremost, an individuals' progress in educational sector depends largely on his/her academic performance in secondary school scholarly activities. Success in secondary school subjects determine future careers or professional choices of any academic. As at present, credit passes in relevant secondary school subjects are basic requirements for admission to study various courses at the tertiary education levels. In Nigeria, cases abound where many candidates have been denied admission because they failed to sit for relevant secondary school subjects in the Unified Tertiary Matriculation Examination (UTME) organized by the Joint Admission Matriculation Board (JAMB).

Furthermore, the competitive nature of businesses all over the world and in Nigeria demands that employers should look out for the best among numerous job seekers. This is with the hope that

the best hands will render best services, increase productivity and help their employers maximize profit to remain in business, (Ogba, 2020). Thus, the labor market has become more competitive in recent times than it has ever been. No doubt, one of the criteria for judging and choosing the best in most employment screening is academic performance. This is further aggravated by the unpopular emphases on paper qualification by employers in developing countries such as Nigeria, Eje (2019). As a result, students strive to attain high academic performance to enhance their chances of securing good jobs after school. More so, students' academic performance is one of the cherished indices for rating and ranking of educational institutions including secondary schools.

Hence, every educational institution is interested in ways by which to increase her students' academic performance as no institution would like to be rated or ranked low. Secondary school students' academic performance was related to their motivation to succeed by Raphael (2018). Raphael identified three attribution dimensions that influence a person's academic performance. These include locus of control (internal vs. external causes), stability (long term vs. short term effects) and controllability (controllable vs. uncontrollable). Locus of control according to Raphael refers to beliefs about whether a given outcome was caused by the individual or by some external factors outside of his control. For example, some students attribute their failure on exams to luck.

Other students believe that factors such as effort or their level of knowledge of a particular area are responsible for their grades. Thus, students in the latter group will try harder if they are dissatisfied with their academic performance while students in the former group will result to prayers or some fetish practices if they are dissatisfied with their academic performance. Stability refers to a cause being attributed to their unstable or stable factors that lead to positive or negative results. For example, a student may attribute poor performance to an illness that came on suddenly before an exam. On the other hand, another student might attribute poor academic performance to factors that the student perceives as beyond his control. Ojunta (2019) hinted that some students will say that the task is just too difficult which can lead to a decrease in the

student's effort to improve his academic performance on that task. Controllability refers to whether or not a person feels that he has control over a given outcome. For example, a student who attribute academic failure to uncontrollable factors may decide that the teacher create biased and confusing exam questions that are designed to promote students failure.

Thus expanding a great deal of effort would be a waste to time. On the other hand, a student who attribute success to controllable factors might decide that his performance was due to methods of studying and would be more likely to feel motivated to change something about the way that he studies in order to attain a more acceptable outcome, (Lander, 2019). More factors that could jointly impact on secondary school students' academic performance were identified by other researchers. Pwag (2020) classified factors that could impact on secondary school students' academic performance as follows; Knowledge-oriented, economic-oriented, psychological and environmental-oriented factors. Dandutse (2019) grouped the factors under three broad sub-headings viz; environmental sfactors, student-related factors and teacher-related factors. According to Dandutse, the teacher-related factors seem to be more serious as they include teacher-qualification, teacher's knowledge of the subject matter, teacher instructional delivery ability, teacher motivation, teacher adoption/choice of teaching methods/strategies, teacher personality, teacher self-worth, teacher self-esteem and teacher self-efficacy. Therefore, this study is, to say the least, most timely as it intends to investigate the study skills needed by secondary school students' for improved academic performance in computer studies in Enugu state.

Influence of Gender

Gender is a major factor that influences the students' behaviour including career choice and subject interest of the student. According to Nweke (2013), gender or sex refers to those characteristics of males and females which are biologically determined such as possession of the male and female reproductive genital organs. Nweke further gave a broad analytical concept which draws out females role responsibilities in relation to those of males

describing the males attribute as bold, aggressive, tackful economical use of words, while females are fearful, timid, gentle, dull, submissive and talkative. Akan (2012) alleged that in schools, males are more likely to take difficult subjects areas like sciences, while the females take to careers that will not conflict with marriage chances, marriage responsibilities and motherhood and this may influence their study skills.

Evidently, teachers also, encourage gender stereotype by giving different treatment to males and females. Teachers go further to give different career guidance to males and females. This may also influence their study skills.

More worrisome to the researcher is the fact that past researchers have reported conflicting findings on the academic performance on male and female students' study skills. Akan (2002), Jumoh (2023) and Rex (2019) found that male students showed poor results compared to their female counterparts who had better results. Ndume (2019) and Abel (2024) found the contrary. While Okeke (2023) and Walter (2020) found no significant difference between the academic performance on the study skills of male and female students. This no definitive conclusion justifies the need for this present study. It is important to state that male and female students in secondary schools in Enugu state will respond to the items in the instrument for data collection. This is due to the fact that the variables used in this (study skills, students' academic performance and students' gender) have the potentials to revamp, overhaul and transform the secondary education sector if well utilized. This certainly enhances the dependability.

CHAPTER 4

Topic:

TECHNOLOGY AND ENHANCEMENT OF EDUCATIONAL MANAGEMENT PRACTICES IN SECONDARY SCHOOLS IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Technology

Grant (2015) reported that the word technology originated from two Greek words; techne and logia. The Greek according to Rex used the term to denote arts, skill or cunning of hands. Hence technology was used to refer to the collection of techniques, skills methods and processes used in the production of goods and services or in the accomplishment of objectives, such as scientific investigation. It can simply be referred to the science of craft. The knowledge of techniques, processes, etc can be referred to as technology. Similarly, technology can be embedded in machines, computers, devices and factories, which can be operated by individuals without detailed knowledge of the workings of such things.

Plum (2015) traced the origin of man's use of technology to the beginning of attempts to convert natural resources into simple tools. The prehistoric discovery of how to control fire and the later Neolithic revolution increased the available sources of food and the invention of the wheel helped humans to travel in and control their environment. Developments in historic times, including the printing press, the telephone, and the internet, have lessened physical barriers to communication and allowed humans to interact freely on a global scale.

The steady progress of military technology has brought weapons of ever-increasing destructive power, from clubs to nuclear weapons. According to Samuelson (2013) the use of the term technology has changed significantly over the last 200 years. Before the 20th century, the term was uncommon in English, and usually referred to the description or study of the useful arts. The term was often connected to technical education, as in the Massachusetts institute of technology (chartered in 1861). The term technology rose to prominence in the 20th century in connection with the second industrial revolution. Samuelson narrated that the term changed in the early 20th century when American social scientists, beginning with Thorstein Veblen, translated ideas from the German concept of Technik into technology.

Tiz (2013) added that in German and other European languages, a distinction exists between technik and technology that is absent in English, which usually translates both terms as technology. By the 1930s, technology referred not only to the study of the industrial arts but to the industrial arts themselves. According to Tiz, in 1937, the American Sociologist Read Bain wrote that technology includes all tools machines, utensils, weapons, instrument, housing, clothing, communicating and transporting devices and the skills by which we produce and use them. Bain's definition remains common among scholars, especially social scientists. But equally prominent is the definition of technology as applied science, especially among scientists and engineers, although most social scientists who study technology reject this definition, more recently, scholars have borrowed from European philosophers of technique to extend the meaning of technology to various forms of instrumental reason, as in foucault's work on technologies of the self (techniques de soi). Kuntu (2013) defined the term technology as the practical application of knowledge especially in a particular area" and a capability given by practical application of knowledge.

Kuntu further gave another definition of the concept; it is practice, the way we do things around here, the term is often used to imply a specific field of technology, or to refer to high technology or just consumer electronics, rather than technology as a whole. Hung (2014) defined technology in two ways: as the pursuit of life

by means other than life, and as organized inorganic matter. According to Hung technology can be most broadly defined as the entities, both material and immaterial, created by the application of mental and physical effort in order to achieve some value. In this usage, technology refers to tools and machines that may be used to solve real-world problems. It is a far-reaching term that may include simple tools, such as a crowbar wooden spoon, or more complex machines, such as a space station or particle accelerator.

Tools and machines need not be material; virtual technology such as computer software and business methods fall under this definition of technology. Similarly, Lee (2014) gave another broad definition of technology as a means to fulfill a human purpose. According to Lee, the word technology can also be used to refer to a collection of techniques. In this context, it is the current state of humanity's knowledge of how to combine resources to produce desired products, to solve problems, fulfill needs, or satisfy wants it includes technical methods, skills, processes, techniques, tools and raw materials. When combined with another term, such as medical technology, communication technology or information and communication technology, it refers to the state of the respective field's knowledge and tools.

From the foregoing, technology can be viewed as the activity that forms or changes culture. Additionally, technology is the appreciation of math, science, and the arts for the benefit of life as it is known. A modern example is the rise of communication technology, which has lessened barriers to human interaction and as a result, has helped spawn new subcultures: the rise of cyberculture has at its basis, the development of the internet and the computer. However, not all technology enhances culture in a creative way; technology can also help facilitate political oppression and war via tools such as guns. As a cultural activity, technology predates both science and engineering, each of which formalize some aspects of technological endeavor, (Lee, 2014).

Technology has many effects. It has helped develop more advanced economies (including today's global economy) and has allowed the rise of a leisure class. Many technological processes produce unwanted by-products, known as pollution, and deplete

natural resources, to the detriment of Earth's environment. Various implementations of technology influence the values of a society and new technology often raises new ethical questions, examples include the rise of the notion of efficiency in terms of human productivity a term originally applied only to machines, and the challenge of traditional norms, (Clerk, 2019).

Philosophical debates have arisen over the use of technology, with disagreements over whether technology improves the human condition or worsens it. According to Kuntu (2013), Neo-Luddism, Anarcho-primitivism, and similar reactionary movements criticize the pervasiveness of technology in the modern world, arguing that it harms the environment and elienates people; proponents of ideologies such as transhumanism and techno-progressivism view continued technological progress as beneficial to society and the human condition. The school, such as secondary school, is a social institution. Also personnel management is a concept that deals with human management, hence, human relations is a vital component. Human relations is also a social activity. It is therefore expedient to see how technology impacts on social relations in the society at large and school in particular.

With the proliferation of technologies that are able to overcome the obstacles of time and space (eg, airplanes, cars, the internet), one would think that these tools would be used to gain an understanding of other cultures, meet people all over the world, maintain and strengthen familial relationships, communicate effectively with others, and help people to become more socially adept. However, some technological advances cause people to be distracted, overly stressed, and increasingly isolated. Many people are involved in an abundant number of relationships through technological, but sometimes the quantity of these associations leaves people feelings qualitatively empty, (King, 2012).

Obviously, technology has had a profound impact on what it means to be social. Society is likely on the cusp of a social revolution, during which it will be important to redefine socially appropriate and acceptable Behaviour (with regard to digital or virtual interaction). We are at a point in history where very few people have given critical thought to new social realities created by

technology and what those realities mean to the individual and society. This further justifies the rationale for this study which is on principals' application of information and communication technology for personnel management practices in secondary schools. The next section is devoted to the concept of information and communication technology.

Concept of Information and Communication Technology

In attempt to give the etimology of the phrase information and communication technology (ICT), Grant (2015) stated that the phrase information and communication technology has been used by academic researchers since the 1980s, and the abbreviation ICT became popular after it was used in a report to the UK government by Dennis Steveson in 1997, and in the revised National curriculum for England, Wales and Northern Ireland in 2000. But in 2012, the Royal society recommended that ICT should no longer be used in British schools as it has attracted too many negative connotation and with effect from 2014 the British National Curriculum uses the word computer which reflects the addition of computer programming into the curriculum.

Variations of the phrase have spread worldwide, with the united nation's creating United Nations information and communication technologies task force and an internal office of information and communications technology. Iguma (2011) held that Information and Communication Technology (ICT) is an extended term for information technology (ICT) which stresses the role of unified communications and the integration of telecommunications (Telephone lines and wiresles signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.

According to Uji (2011), the term ICT is also refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the telephone network with the computer network system using a single unified system of cabling,

signal distribution and management. However, ICT has no universal definition as the concepts; methods and application involved in ICT are constantly evolving on an almost daily basis.

To Plum (2015), the broadness of ICT covers any product that will store retrieve, manipulate, transmit or receive information electronically in a digital form, eg. Personal computers, digital television, email, robots. For clarity, zuppo provided an ICT hierarchy where all levels of the hierarchy contain some degree of commonality in that they are related to technologies that facilitate the transfer electronically mediated communications. Samuelson gave another definition of ICT as systems or technologies for processing information in text, data image and voice form and extends to international telecommunication network.

Ali (2004) in Adeleke (2011) described ICT as the use of scientific tools and techniques for developing, documenting and communicating information when needed especially as they concern solving problems or providing needed services in the various areas of human endeavor. Information and communication technology is also seen as a product of information revolution. Thus, ICT is the application of science to information handling. It consist of the hardware, software, processing, transmission and presentation of information (voice, data, text images) as well as related services.

In modern society ICT is ever-present, with over three billion people having access to the internet. With approximately 8 out of 10 internet users owning a smart phone, information and data are increasing by leaps and bounds, (Kuntu, 2013). This rapid growth, especially in developing countries, has led ICT to became a keystone of everyday life, in which life without some facet of technology renders most of clerical, work and routine task dysfunctional. According to Clerk (2019). Authoritative data released in 2014, shows that internet use continues to grow steadily at 6.6% globally in 2014 (3.3% in developed countries, 8.7% in the developing world); the number of internet users in developing countries has doubled in five years (2009-2014), with two thirds of all people online now living in the developing world.

However, hurdles are still at large of the 4.3 billion people not yet using the internet, 90% live in developing countries. In the

world's 42 least connected countries (LCCs), which are home to 2.5 billion people, access to ICT remains largely out of reach, particularly for these countries large rural populations, (Clerk, 2019). ICT has yet to penetrate the remote areas of some countries, with many developing countries dearth of any type of internet.

This also includes the availability of cellular coverage, and other forms of electronic transmission of data. The increase in the aforementioned cellular data coverage, according to Clerk (2019), is Ostensible as many users have multiple subscriptions, with global growth figures sometimes translating into little real improvement in the level of connectivity of those at the very bottom of the pyramid; as estimated 450 billion people worldwide live in places which are still out of reach of mobile cellular service. Favourabily the gap between the access to the internet and mobile coverage has decreased substantially in the last fifteen years, in which 2015 is the deadline for achievement of the united Nation millennium development goals; (MDGs), which global leaders agreed upon in the year 2000. ICT continues to take a new form, with nano technology set to usher in a new wave of ICT electronics and gadgets. ICT nearest editions into the modern electronic world include smart watches, smart wristbands, smart phones and smart TVS.

With desktops soon becoming part of a byegone era, and laptops becoming the preferred method of computing, ICT continues to insinuate and alter itself in the ever changing globe. Information communication technologists play a role in facilitating accelerated pluralism in new social movements today. Lee (2014) observed that the internet is accelerating the process of issue group formation and action and coined the term accelerated pluralism to explain these new phenomena. ICTs in the word of Lee, are tools for enabling social movement leaders and empowering even dictators in affecting promoting societal change. ICTs can then be used garner grassroots supports for a cause due to the internet allowing for political discourse and direct interventions. With appropriate policy as well as change the way complaints from the populace are handled. It therefore follows that a secondary school principal who wishes to succeed as a leader and a manager of people must embrace ICT.

Educational Management Practices

Dunga (2011) hinted that educational management involves two categories of practices or functions, namely; managerial and operative. Basic managerial functions include planning, organizing, motivating and controlling. These are common to all managers including educational managers. The planning function of an educational manager pertains to the steps taken in determining a course of action. This involves developing an educational programme and specifying what and how operative practices are to be performed. After plans have been a developed, the educational manager must establish an organization to carry them out. This practice or function. Therefore, calls for groupings of educational activities, assignment of different group of activities to different individuals, delegation of authority to carry them out and provision for coordination of authority relationships horizontally and vertically in the organization structure.

Dunga explained that motivation involves guiding and supervising. Educational management must inculcate in the workers a keen appreciation of the organizational policies. He must guide them towards improved performance and motivate them to work with zeal and confidence. Control involves measuring performance, correcting negative deviations and assuring the accomplishment of plans. Through direct observation, direct supervision, as well as report, records and audit, educational management assures itself that its practices are being carried out in accordance with the plans, (Samuelson, 2013)

Samuelson further hinted that the basic element of educational manager can broadly be grouped into five viz:

(i) Planning
(ii) Staff Development
(iii) Staff welfare
(iv) Supervision of instructional procedures
(v) Enforcement of discipline

Since this study is based on the five educational management practices listed above, it is expedient to discuss them below.

Planning

Planning is a fundamental management function that involves setting objectives, identifying resources, and outlining steps to achieve desired outcomes. It provides a roadmap that guides actions and decisions, ensuring that efforts are coordinated and purposeful. In the context of education, planning is not just about predicting the future but about preparing for it, reducing uncertainty, and aligning activities with long-term goals. Without planning, institutions risk operating reactively, which often leads to inefficiency and wasted resources, (Zippoh, 2019). When applied to educational technology management in secondary schools, planning ensures that technology integration is systematic rather than haphazard, (Samuelson, 2013).

Schools that plan effectively can identify the specific needs of students and teachers, select appropriate tools, and establish clear policies for usage. This prevents the common pitfall of acquiring expensive devices or software without a clear vision of how they will support teaching and learning. A well-thought-out plan also anticipates challenges such as maintenance, training, and equitable access, making technology adoption more sustainable, (Dunga, 2011). Moreover, planning enhances accountability and resource management in educational technology. Secondary schools often operate with limited budgets, and careful planning helps administrators prioritize investments that yield the greatest educational impact. For instance, instead of purchasing gadgets for novelty, a planned approach might emphasize teacher training, digital literacy programs, or infrastructure upgrades like reliable internet connectivity. This ensures that technology is not just present in schools but is effectively used to improve learning outcomes.

In addition to guiding resource allocation, planning in educational technology management also strengthens collaboration among stakeholders in secondary schools. Teachers, administrators, students, and even parents can be involved in the planning process, ensuring that diverse perspectives are considered. This collaborative approach builds ownership and commitment, making it more likely that technology initiatives will be embraced and effectively implemented, (Maris, 2017). When stakeholders feel included, they

are more willing to adapt to new systems and contribute to their success, (Clerk, 2019).

Planning also plays a critical role in professional development. Technology is only as effective as the people who use it, and without adequate training, even the most advanced tools can fail to deliver results. A well-structured plan ensures that teachers receive continuous training and support, enabling them to integrate digital tools into their pedagogy confidently. This not only enhances teaching effectiveness but also prepares students for a world where digital literacy is essential. By embedding training into the planning process, schools avoid the common issue of underutilized technology, (Amusan, 2012). Another important aspect of planning is risk management. Technology adoption in schools comes with challenges such as cybersecurity threats, data privacy concerns, and potential system failures, (Yinka, 2012).

Through careful planning, schools can anticipate these risks and develop strategies to mitigate them. For example, planning might include establishing clear policies on data protection, setting up backup systems, or scheduling regular maintenance checks, (Clauss, 2018). This proactive stance ensures that technology remains reliable and safe, protecting both students and staff. Finally, planning ensures that educational technology initiatives are aligned with broader educational goals and curriculum standards. Technology should not be an isolated add-on but a tool that supports teaching objectives and enhances learning outcomes. By linking technology plans to curriculum requirements, schools can ensure that digital tools are used meaningfully for example, using interactive simulations in classes or digital platforms for collaborative writing in language studies. This alignment makes technology a powerful enabler of education rather than a distraction, reinforcing its value in secondary school management, (Zippoh, 2019).

Staff Development

Another vital educational management practice is staff training and development. Cater (2013) alleged that many heads of organizations erroneously think that they have nothing to gain from

staff development programmes. This is because it costs some organizations so much to train and retrain their staff. However, Cater hinted that staff development benefits organizations maximally as it improves and enhances workers' productivity and dedication. Cater therefore defined staff development as the process of developing qualities in human resources that will enable them to be more productive and thus contribute more to organizational goal achievement. Staff development vary in type and extent and according to the nature and skills of the jobs involved, as well as the experiences of the employees concerned.

Fame (2015) defined staff development as the process of increasing the knowledge, skills and capacity of the staff in the organization for promoting its economic, political, and social or any other desired growth. Fame contended that the best staff development programme for a secondary school is on the job training. Oshinebo (1992) in Udoh (2012) suggest five on-the-job training methods that may be very useful. They are;

1. Coaching, that is, the trainee is put under the guidance of an experienced employee who shows the trainee how to do the job;
2. Job rotation, that is, the trainee in given several jobs in succession so as to gain experience on wide range of activities.
3. Temporary promotion, that is, an individual is promoted into his/her superiors position whilst the superior is absent, due to some reasons. This gives the individuals of a more senior position;
4. Assistant to, that is, a junior officer with good potentials may be appointed as assistant to another top officer in this way, the individual gains experience of how the organization is managed at the top.
5. Committees, that is, trainees might be included in the membership of committees to enable them to gain an understanding of inter-departmental relations.

On the objectives of staff development, Rex (2011) stated that training aims at equipping the workers with the necessary skills to

enable them remain employed, to gain promotion and to have reasonable expectation of re-employment in the event of their being made redundant. Adeleke (2011) addressed that since staff development aim at increasing the productivity of employee by influencing their behavior, concerted efforts should be determined, adequate training programmes designed and training evaluation administered.

The first step in the training process is the determination of training needs. It involves the information or skill areas of an individual or group that requires further development in increasing the productivity of that individual or group. It should also be noted that the training or organization of members is typically a continuing activity, to the extent that even employees who have been with the organization for sometime and who have undergone initial orientation and skills training need continuous training to improve their skills. After determining the training needs of the workers, the educational manager now designs a training programme aimed at meeting those needs.

According to Amusan (2012) orientation is the process of informing new employees about what is expected of them in the job and helping them to cope with the stresses of transition. Hence, training of the employee begins with the orientation programme. Orientation involves introducing and guiding the new employees to the organization and the various units. It is important that new employees become familiar with the organizations policies, procedures and performance expectations. Staff development may involve refresher courses, sandwich or part time courses, full time sponsored courses, attendance of workshops, seminars and conferences that build capacity. Principals play vital roles in staff training development starting from recommending staff that should be trained or staff that should benefit in any form of development to serving as resource persons in capacity building workshops, seminars and conferences. Some principals are also consultants in various academic professional bodies that train secondary school staff.

Staff Welfare

Staff welfare is another vital educational management practice which must not be toyed with if the objectives of secondary schools must be achieved. It is stating the obvious, to say that a well motivated workforce is that whose welfare are given priority by the employees. Ayu (2011) submitted that staff welfare can summarily be seen as the social responsibility which, all employers owe other workers. Yinka (2012) summarized the social responsibilities, which all employers owe to workers as: provision of heavily subsidized food, uniform, medical treatment for him and his family, transportation to and from work, pay for accommodation, payment of school bills for at least one of his dead parents, provide facilities for recreation, prepare him for retirement through counseling and provision of relevant facilities, visit him at home when sick and when he dies, announce his obituary with funfare and bury him decently while ensuring his dependants don't suffer.

Unarguably, when these social responsibilities are met, the multiplier effect could be to elicit job satisfaction with positive externalities on workers' efficiency, productivity and commitment. Little wonder why Brooks (2014) enumerated the purposes of welfare services as:

i. Provide personal advice and assistance to individuals and
ii. Encourage a positive relationship between the individual and the organization by providing extra security and comforts.

Evidently, welfare of staff is very germane in every organization and any organization that neglects staff welfare, cannot get higher productivity from the labour force. A very useful tool with which a secondary school principal may meet his staff's welfare is cooperative society or cooperative union. Dunga (2011) defined a cooperative society or union as an autonomous association of people united voluntarily to meet their common economic, social cultural needs and aspirations through a jointly owned and democratically controlled business. Adeleke (2011) similarly defined cooperative society or union as a jointly owned enterprise engaging in the production or distribution of goods or the supplying of services,

operated by its members for their mutual benefits. Cooperative business are topically more economically resilient than any other form of enterprise.

Cooperative date back as far as human beings have been organizing for mutual benefits. Tribes were organized as cooperative structures, allocating jobs and resources among each other, only trading with the external communities. A broader definition was given by Amusan (2012) as a non-proft community organization and businesses that are owned and managed by the people who use their services (a consumer cooperative) or by the other people who work there as cooperative) by the people who line there as (a housing cooperative) and hybrids such as worker cooperatives that are also consumer cooperative or credit unions. There are also multi-stake holder cooperatives such as those that bring together civil society and local actors to deliver community needs and second and third tier cooperatives whose members are other cooperatives.

Traditionally, cooperatives combine social benefits interest with capitalistic interest. Cooperatives achieve a mix of social and capital purposes by democratically governing distributions by and between equal controlling members. A secondary school principal, as a personnel manager, can therefore enhance staff welfare through staff cooperative unions. Such cooperatives union can among other things run thrift and soft loan schemes. From experiences, so many secondary school staff cooperatives in Enugu State, make bulk purchases of essential commodities and share among members. Also so many teachers have purchased landed property through the help of cooperatives. Interestingly, some cooperatives retain their members even after retirement.

Supervision of instructional procedures

The importance of school supervision in today's educational system demands for greater attention and is becoming more conscious now than in the past. School Supervision has generated interest in the daily operation of the school system. In particular, supervision of instructional procedures has always been regarded as an essential educational practice. According to Obasi (2018)

students', teachers', administrators are individuals of worth, endowed with unique talents and capacities but it is through the process of supervision that these talents are stimulated. According to Kuntu (2020), supervision can be said to be gathered efforts of designated school officials towards providing leadership to the teachers and other educational workers in the improvement of instructions. By this definition, supervision of instruction takes care of all that is undertaken in the school to facilitate learning. The consideration is on educational institution to provide learning facilities, way of raising the morals of teachers, conditions service and security. Supervision of instruction is also seen by some scholars as a phase of school administration. Henshaw (2019) refers to supervision as "one of the techniques of educational administration necessary for the achievement of educational objectives".

The need for supervision of instruction in all educational institutions cannot be over emphasized without adequate supervision of instruction, no effective learning can take place since interest to learn and to teach is stimulated through supervision. The importance of supervision of instructions has been recognized all over the world. Consequently, all ministries of education in Nigeria for instance, have supervisory division attached to them. To bring about improvement in learning, supervision must concern itself not just with teachers alone, but also on all other considerations which may affect their performances. Nevertheless, supervision is the focus of this study (Ajom, 2018). It has been discovered that teachers usually have greater potentials or ability to work when supervised than they usually, do. Some teachers are fully determined to work but for certain reasons, productivity is often low. These reasons may include such things as low and irregular payment of salaries, poor conditions of service to teachers, climate, poor equipment and the like. According to Jida (2017), effective supervision tends to assuage those bitter conditions and motivate both the teachers and the learners.

Supervision goes hand in hand with motivation. The performance of motivated teachers is not sporadic like eye service and cannot be maintained by the use of force but will be observed in

the dedication of the teachers to work in the absence of the boss. Some writers have seen the supervisory process as interpersonal in nature. Raphael (2018) asserted that supervision operationally focuses on a dynamic relationship where in one person (the supervisor) tries to help other person improve the way he/she is teaching. Raphael continued by saying that supervision is a process of change. The supervisor is the changing agent whose responsibility is to provide the variety of resources that may be necessary for the teacher to see the need for change, to plan to change, to enact new behaviour and to test out its effectiveness. This description has more or less given supervision a new dimension as an object for change. At times, people are not aware of what they are doing. The nature of supervision affords individuals an insight into all these. To buttress this, Maris (2017) sees internal supervision as an appraisal or in-school evaluation of the students and staff by the school to help with its decision making and the professional development of its staff.

Supervision should also be seen as related teaching effectiveness. Clauss (2018) noted that a new approach to supervision that include scheduling meetings and collaborative enquiry proved to be effective to teacher's performance as against laymen in the early 19th century. Modern supervision therefore makes use of meetings as a method of improvement. Indeed, a lot of authors have acknowledged the fact that there has been a change in the mode of supervision. According to Zippoh (2019) supervision today has taken a new look. It has been a skilled and specialized service rendered to teachers through the ministry of education and the head of each school within the system. Zippoh continued by saying that teachers nowadays receive prior notice before they are visited. Zippoh summarized modern supervision as being positively oriented and democratic in approach. It also promotes the spirit of finding out facts through experimentation and continuous evaluation. The above definition has to do with the modern supervision and research. A method of using supervision to investigate critically the hypothetical assumptions about teaching and learning, (Kyap, 2019).

The modern supervision therefore recognizes the capabilities of their personnel in the job of providing guidance for improved teaching and learning. Zeph (2020) had this to say of some of the personal qualities of a supervisor; His intuition, humility, friendliness, thoughtfulness, sense of humor-his effect on others as well as his patience are essential characteristics because supervision deals with relationship between people. So one can conclude that his effectiveness depends on his understanding of human behaviour. Few also went on to say that a supervisor should be a person who has high native intelligence and a broad grasp of the educational process in the society, he should have love for children and an abiding interest in them and their learning problems, he should be an expert into democratic group process as all their qualities will help him to develop and understand good human relations which are vital in modern supervision as a means of improving teaching and learning situations in schools.

In the old days, supervision was carried out by a number of persons who had no professional qualifications no wonder they acted as fault finders, spreading wavers of anxiety and tension to the entire school environment such that the principals, teachers and students remained constantly on edge throughout the period of supervision and only to have a sigh of relief at the departure of the supervisors, Jack (2016). In Nigeria today, Otobo (2017) averred that where there are many ethnic groups and different religious adherents such as Christians, Muslims animists, the possession of a broad education by the supervisor helps him to be tolerant and empathic in the principal's advisory functions in schools. Continuing, Otobo contended that the supervisor of schools should possess adequate professional education or qualification, which include Higher Elementary Certificate or Grade Two Certificate, Nigerian Certificate of education, Bachelor of Arts/Science in Education, Master of Education. Consequently, personal qualities of the principals can affect their supervision which is the focus of study.

Enforcement of Discipline

The word "discipline" has been variously defined, Ikechi (2020) defined discipline as practice of making people obey rules and orders, or the controlled situation that results from this practice. Tambo (2018) refers to discipline when students are taught to respect the school authorities, to observe the school Laws and regulations and to maintain an established standard behaviour. Discipline therefore connotes politeness, acting with decency and decorum, not out of fear of punishment, but out of a high sense of responsibility. A disciplined, student loves orderliness, obeys rules and regulations of the school. He can be entrusted with major responsibilities and can demonstrate respect for authority. Discipline can also be described as being able to control one's behaviour and manner of working operations. A disciplined individual does good simply because it is good to do good, not in the hope or expectation of some rewards.

Discipline is of vital importance in the school system because without discipline teaching and learning will be impaired. Stressing this point, Maris (2017) held the view that children need discipline, want discipline and would be insecure without discipline. Udoh (2017) conceived discipline primarily as systematic training, through education or as a mode of life in accordance with the rules of the society. Obasi (2018), conceived discipline as punishment or enforcing obedience or orderly conduct or motivating pupils to take responsibilities with trust and confidence. The modern concept of discipline is more of staff-control. An individual has self-discipline when he can set a goal for himself and make whatever sacrifice and efforts it takes to obtain it. The goal of school discipline is to build a level of self-control so that proper habits will be followed without the use of authority. Self-control will provide the appropriate atmosphere for work in the various school locations and situations (Ojim and Nyim, 2018).

Experts in education are of the opinion that as it concerns discipline, the emphasis today is on developing permanent educational values rather than on maintaining order in the school, on training boys and girls to desire to be acceptable and useful beings rather than destructive and harmful one's, on training an

individual to govern his own conduct rather than being dependent upon government or others. By implication, today's discipline on schools has more to do with inculcating in the individual the value which make him long to become a disciplined citizen. It is no longer in form of conditioned learning whereby the individual is forced by rules and regulations to conform to acceptable behaviour. Lee (2018) also viewed discipline as an attitude of mind which produce self-control obedience, adherence to norms in the absence of any sanction or supervision. Discipline can also mean readiness and prompt adherence to rules and regulations as occurs with the military.

In a school system, students are taught to respect the school authorities, observe rules and regulations and to maintain an established standard behaviour. In the same vein they are made to see that lack of discipline generates unruly behaviour which could be regarded as any act which does not conform with the societal norms and values. Indiscipline is any act that is inconsistent with the established rules and regulations governing an institution. Dapang (2018) conceived indiscipline as a violation of schools' rules and regulations capable of obstructing the smooth and orderly functioning of the school system. This he said should be avoided through perfect orientation of students and imposition of positive sanction in cases of obvious violation of order.

With particular reference to school, Dapang wrote that discipline is to teach the students to respect the school authorities to observe the school laws and regulations and to maintain an established standard behaviour. Disciplined behaviour according to Shehu (2018) involved such characteristics as self-sacrifice, diligence, cooperation, integrity, truthfulness patriotism, consideration for others and sympathy. According to Raphael (2018) "discipline involves self-control, restraint, respect for self and respect for order. The disciplined person is guided in his behaviour, moral and social principles and does what is right and good. Clauss (2018) equally defined discipline as the readiness or ability to respect authority and observe conventional or establish laws of the society or of any organization". Al-Jaradeen (2019) went further to define discipline as the ability and willingness to do what

one ought to do without external control. Prompting from these definitions, one can now define discipline as the voluntary and deliberate effort to submit oneself to established code of conduct and acceptable pattern of behaviour of a society so as to achieve mutual cooperation and general happiness for mankind.

Influence of technology on educational management practices

The influence of technology in educational management practices in this technology-driven age is very enormous. When applied to educational technology management in secondary schools, planning ensures that technology integration is systematic rather than haphazard, (Samuelson, 2013). Schools that plan effectively can identify the specific needs of students and teachers, select appropriate tools, and establish clear policies for usage. This prevents the common pitfall of acquiring expensive devices or software without a clear vision of how they will support teaching and learning. A well-thought-out plan also anticipates challenges such as maintenance, training, and equitable access, making technology adoption more sustainable, (Dunga, 2011). Moreover, planning enhances accountability and resource management in educational technology.

In staff development, technology is also very useful. Amusan (2012) suggested that one of the best training a secondary school will give her staff in today's world is training on technology skills and competence. Amusan argued that most staff trained in one form of technological skill or the other usually have something to fall back on after retirement. Instructional techniques that are in vogue today are mostly technology-driven (Rex, 2011). Thus; training of secondary school staff on the influence of technology are of unquantifiable benefits. To train teachers or other staff in the use of technology teaching strategies is a way of enhancing educational management. In all, technology is used for publicizing training opportunities. Technology is used for preparing training materials. Technology is used for delivering training lecture or lessons, it also influences grading and certifying trainees.

Some staff development projects are done on-line with the help of internet. Many secondary school staff today, engage in

correspondent courses. Some register for sandwich university courses where even application forms are purchased and completed on-line. Such staff need to be helped to acquire at least basic technological skills and literacy that will help them cope. Finally, Rex (2011) submitted that an important influence of technology in educational management practices, especially in educational institutions is maintenance of a viable database of the staff of the institution. Rex (2011) defined a database, simply, as an organized collection of data. The data are typically organized to model aspects of reality in a way that supports processes requiring information. Rex recommended that this can be better done through a database management system (DBMS). DBMS is a computer software application that interacts with the user, other applications, and the database itself capture and analyze data. DBMS are designed to allow the definition, creation, querying, update and administration a well organized data about something or someone, of a truth, this will solve the problem of missing files and inability to capture or retrieve vital information about a staff when needed. Staff will also feel better secured when they known that their data are safe, secured and accessible to them at the shortest notice.

Influence of school ownership on technology and educational management practices

School ownership as used in this study is categorized into two, namely; public and private schools. Public secondary schools are those owned, and funded by the government, be it federal, state or local government areas. On the other hand, private schools refer to schools owned and funded by private individuals, missions, cooperate bodies or any non-governmental organizations. School ownership is an important variable to this study for many reasons. First, the level of personnel management practices or functions principals carry out in public and private secondary schools vary greatly. Ikechi (2011) reported that a sizable number of private secondary schools have their proprietors/proprietresses as principals who is, more or less, the sole administrator. This is far from what is obtainable in public schools where government is the proprietor and board or commission that oversees the principals functions.

Furthermore, influence of technology either for educational management or for teaching in public and private schools differ. Many private schools charge very high fees, yet their proprietors shy away from money demanding ventures such as computerization and functional technological centers, (Eze, 2010). Eze alleged further that the story is not different in public schools where government purchase obsolete equipments. It is obvious that even some modern technological equipments supplied to many public schools are not put to use. This is because some school management, for fear of theft, pack those equipments in a safer place, usually outside the school compounds, either in PTA chairman's house or that of the traditional ruler's or a trusted community leader. Eze reported that the practice in such public secondary schools is to display the equipments in their schools whenever inspectors, external supervisors or any accreditation team visits them.

Moreso, a serious disease regarding progress in the public and private secondary schools alike is poor funding. With poor funding, the principal is handicapped if he wishes to use facilities from commercial vendors. So, even when the facilities are not available in the school, the principal cannot afford to pay for services from either business centers, cyber café or other technological service providers. The problem of poor financing of private schools cannot be completely divorced from proprietor's quest to maximize profit by minimizing cost even at the detriment of quality services.

Similarly, government at all levels have been accused of paying lipservices to education. For instance, the United Nations Educational and Scientific Organization (UNESCO) recommended that third world countries or developing nations such as Nigeria should commit not less than 26% of their annual budgetary allocations to education. Yet, Nigerian Government, according to Amusan (2012) have not seen the need to allocate even 15% of her annual budget to education.

At this juncture, it is expedient to pick those personnel management practices identified in this study and see how school ownership influences Principals' application of ICT to each of them. Recruitment and selection of staff in public and private schools

differ. While most public schools recruitment are published, as mandated by Law, in not less than two public media outfits, most private schools are not under such obligation. A cursory look at the above statement may suggest that screening or interview in the public schools are more strict and painstaking. Contrarily, Ikechi (2011) averred that recruitment processes are more difficult in private schools, where the proprietors usually want to employ the best, though they pay little. Ikechi further held that recruitment into public schools are generally politicized and merit is usually neglected and abandoned to quota and favoritism.

On staff development, both government and non government agencies score so low in this area. Lee (2014) stated that majority of the teachers and other staffs in both public and private secondary schools developed or trained themselves with no help from their schools. This notwithstanding, there may still be a few of the public and private schools with reasonable commitment to the training and development of their staff.

Staff welfare is very important to secondary school principals whether in public or private school. No principal would like to work with staff who are not well motivated due to lack of adequate welfare. Hence, as indicated in the literature review on staff welfare, many public and private schools principals do not wait for their proprietors to initiate welfare schemes for their staff. Thus, most public and private secondary school principals initiate and implement schemes and techniques that will foster a healthy and cordial industrial relations.

From the foregoing, principals of public and private secondary schools carry out educational management practices/functions. There is no definitive conclusion on which (public or private) secondary schools have more functional facilities. Both private and public secondary school are poorly funded. Yet, principals of these schools need the influence of technology to enhance educational management practices. This study therefore attempted to determine how technology would enhance educational management of principals of public and private secondary schools in Enugu state.

CHAPTER 5

Topic:

EFFECT OF USE OF CHATBOTS ON ACADEMIC ACHIEVEMENT AND RETENTION OF SECONDARY SCHOOL STUDENTS IN COMPUTER STUDIES IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Chatbots

Chatbots (originally chatterbot) is a software application or web interface designed to have textual or spoken conversations. Modern Chatbots are typically online and use generative artificial intelligence systems that are capable of maintaining a conversation with a user in natural language and simulating the way a human would behave as a conversational partner, (Eze, 2020). Such chatbots often use deep learning and natural language processing, but simpler Chatbots have existed for decades. Rudimentary chatbots were first developed in the mid-to-late 20th century and became more technically sound and widely available in the late 2010s and early 2020s, especially as artificial intelligence (AI) gained prominence in the technology sphere, (Ngoma, 2019). Chatbots have increased in popularity as part of the AI boom of the 2020s, and the popularity of ChatGPT, followed by competitors such as Gemini, Claude and later Grok. AI Chatbots typically use a foundational large language model, such as GPT-4 or the Gemini language model, which is fine-tuned for specific uses, (Melky, 2020).

The idea for the technology that preceded Chatbot programs was first conceptualized by British mathematician and logician Alan Turing. In 1950 Turing proposed a set of criteria to determine

whether a computer was sentient. The premise of the test was that a remote human interrogator, within a fixed time frame, must distinguish between a computer and a human subject based on their replies to various questions posed by the interrogator, (Tenty and Awe, 2021). Turing suggested that the computer's sentience could be measured by whether or how often the human interrogator misidentified the computer as human. This theoretical test of AI became known as the Turing test. The first software program to be recognized as a Chatbot was developed in 1966 by computer scientist Joseph Weizenbaum, (Harry, 2022).

The program, named ELIZA, was capable of simulating conversation with a computer user. By using an electric typewriter connected to a mainframe, a user could type in a conversational phrase, which Eliza would then review using a pattern-recognition algorithm. The algorithm compared the user's input against a set of rules, which would generate appropriate sentences as typewritten responses. While this was considered a historic development in the field of computer science, Eliza's abilities were too limited to pass the Turing test, as Eliza sometimes produced incoherent responses, (Thompson, 2019). In 1995 a Chatbot known as A.L.I.C.E. (Artificial Linguistic Internet Computer Entity) was released by developer Richard Wallace. In creating A.L.I.C.E., Wallace improved upon the AI used by Eliza after monitoring its conversations.

After A.L.I.C.E. was presented with a sentence or phrase that it could not recognize, Wallace would add a response for the Chatbot to use in the future rather than letting it repeatedly produce an incorrect response; this allowed for greater flexibility. As A.L.I.C.E. became more popular, other software designers could add their own responses to the Chatbot's spin-off software. Thus, the bot was capable of answering even more varied inquiries, (Ojim, 2021). The Chatbot Jabberwacky was released by computer scientist Rollo Carpenter in 1997 after he had spent more than a decade on its development. When it first launched, Jabberwacky used a similar rule-based approach to response generation as older Chatbots like Eliza. Jabberwacky has been the subject of continuous development since it first debuted, and in 2008 the program was renamed

Cleverbot. Cleverbot is notable for having the ability to save human responses to questions, which, unlike A.L.I.C.E., allows it to learn without intervention from a developer, (Gbenga, 2021).

Applications

Applications of Chatbots according to Bello (2022) include;

- **Messaging apps:** Many companies' Chatbots run on messaging apps or simply via SMS. Many banks, insurers, media companies, e-commerce companies, airlines, hotel chains, retailers, health care providers, government entities, and restaurant chains have used Chatbots to answer simple questions, increase customer engagement for promotion, and to offer additional ways to order from them. Chatbots are also used in market research to collect short survey responses.
- **As part of company apps and websites:** Previous generations of Chatbots were present on company websites. The newer generation of Chatbots includes IBM Watson-powered "Rocky", introduced in February 2017 by the New York City-based e-commerce company Rare Carat to provide information to prospective diamond buyers.
- **Chatbot sequences:** Used by marketers to script sequences of messages, very similar to an auto responder sequence. Such sequences can be triggered by user opt-in or the use of keywords within user interactions. After a trigger occurs a sequence of messages is delivered until the next anticipated user response. Each user response is used in the decision tree to help the chatbot navigate the response sequences to deliver the correct response message.
- **Customer service:** Chatbots have been proposed as a replacement for customer service departments.
- **Healthcare:** Chatbots are also appearing in the healthcare industry. A study suggested that physicians in the United States believed that chatbots would be most beneficial for scheduling doctor appointments, locating health clinics, or providing medication information.

- **Data security:** Data security is one of the major concerns of Chatbot technologies. Security threats and system vulnerabilities are weaknesses that are often exploited by malicious users. Storage of user data and past communication, that is highly valuable for training and development of Chatbots, can also give rise to security threats. Chatbots operating on third-party networks may be subject to various security issues if owners of the third-party applications have policies regarding user data that differ from those of the Chatbot. Security threats can be reduced or prevented by incorporating protective mechanisms. User authentication, chat End-to-end encryption, and self-destructing messages are some effective solutions to resist potential security threats.

Chatbot technology continued to proliferate in the 2000s and 2010s. In 2001 the development team at AI startup ActiveBuddy released the Chatbot Smarter Child for use on AOL Instant Messenger (AIM). AIM was a popular chat room and instant messaging app, and its users could add Smarter Child to their friends list and converse with it, (Royal, 2018). In 2022 Open AI introduced the generative AI chatbot ChatGPT. ChatGPT is based on a natural language processing model that uses probability to predict words or sentences that its user is expecting. This allows ChatGPT to respond to users in a way that is sometimes indistinguishable from human communication. ChatGPT is capable of writing articles, responses to emails, and even computer code, (Adejumo, 2022). While the widespread adoption of ChatGPT has proven useful in some sectors, the Chatbot does have a reputation for responding in ways that are biased toward the expectations of the user. This leads ChatGPT to occasionally respond with false or misleading data (termed *hallucinations*) or to potentially even plagiarize information, (Larry, 2023).

Educational use of Chatbots

With technology advancing daily, Chatbots have become a popular tool in the education sector. With technology advancing

daily, Chatbots have become a popular tool in the education sector. From virtual tutors to personalized study plans, these bots are changing how students learn, (Ekpe, 2022). Educators can use Chatbots in their school's website or through messaging services like Facebook Messenger or WhatsApp, as well as any in-house school apps that may be available. Everyone associated with the school, including kids, parents, and faculty, will have easy access to them. Chatbots, powered by AI, are increasingly being used in mobile educational apps to make studying more exciting and interactive for students. These apps assist educators by lightening the load of routine duties like grading homework and student work. However, they have the potential to significantly improve formal education and public awareness, (Agogo, 2023).

Technology has made its way into schools despite the common perception that education is not a very tech-savvy business. Research indicates that education is one of the top five sectors reaping the benefits of Chatbots right now, (Beech, 2023). Kuntu and Pedro (2020) listed ways Chatbots can be used in education.

They include;

- **Make information available to students**

Students, especially at the beginning and end of the year, have many questions concerning their lesson plans, classes, schedules, and school guidelines and need easy access to answers. Answering the same questions repeatedly is inefficient when a teacher has a large style. A school (or an individual teacher through uploading course-related materials) can educate a chatbot to respond to student inquiries. Also, new students can rely on the chatbot to help them adjust to their new school.

- **Facilitate administrative tasks**

Chatbots in education are designed to assist students with administrative tasks and common queries, whether in secondary or higher education. Think about the potential benefits of chatbots during times of crisis when parents and students have many inquiries that can overwhelm school staff.

❖ **Providing reminders and support**

The chatbot's role isn't limited to answering queries; it may also send out alerts, updates, and other notifications to students and faculty. The school may not have received your financial aid application, or there may be work at the main entrance. This may be a significant contribution to preventing the "summer melt" or the loss of interest among admitted college students throughout the summer.

❖ **Serving as a private instructor**

Artificial intelligence chatbots in the classroom can evaluate individuals' preferences and strengths in learning. Teachers can better accommodate their students' unique learning styles using this method. At school, chatbots can do things like: offering tailored responses depending on each student's specific questions or concerns, using spaced repetition and other study strategies and aiding students in their academic pursuits. One of the most promising applications of chatbots is their use in making education more accessible to people of all backgrounds. Not all students learn the same way, and others have challenges requiring individualized instruction and special attention. A chatbot can personalize their education by assessing each student's unique situation and focusing on the areas of study with the most incredible difficulty. Each student's unique challenges can be addressed, and their learning can proceed at their own speed.

❖ **Engaging students**

There are certainly duller areas of education. Even the most motivated pupils can fall asleep while reading and memorizing, regardless of the subject matter. Students of all ages today are accustomed to quickly locating information through several tools, such as video and search engines. Instantaneous responses from chatbots for education can provide more engaging learning environments. Bots can use decision trees to help students work through a set of questions and answers to gain a deeper

understanding of a subject. Chatbots can access your library and give appropriate content to help students learn, especially if you have interactive content like video lectures.

- **Helping Educators Teach**

Similarly, a chatbot can be an effective virtual aide in the classroom. It aids educators in developing comprehensive lesson plans and resources while taking care of mundane activities. Sometimes a student just can't get the hang of a particular subject. There are several ways in which chatbots can be used to aid in the classroom, including directing students to relevant online resources for further study. Chatbots in mobile educational apps act as virtual tutors, answering students' questions and providing guidance in solving difficulties. If a student is having trouble understanding a particular concept, they can use these to gain a thorough explanation.

Teachers' regular activities, including assigning work, grading tests, and checking homework, can also be made more accessible with the assistance of chatbots. Conversational agents can help educators with a variety of mundane activities, including, course modules, lessons, daily duties, assignments, and due dates are all topics that chatbots can address.

Student progress can be tracked and evaluated with the help of chatbots by analyzing their written work. Chatbots can enhance student learning since they give students immediate, individualized feedback. By assessing the user's current level of knowledge, chatbots can point them toward valuable educational resources.

Concept of Achievement

The word “achievement” is the noun form of the verb “achieve”. Hence, achievement is the process of bringing about or accomplishing something through effort, skill or courage, (Akiri, 2021). In this work, achievement strictly refers to academic achievement and more specifically, academic achievement in secondary school computer studies. Academic achievement generally suggests an achievement relating to education and

scholarship. (Eze, 2020). According to Adamu (2023), academic achievement depicts students' performance on a standard of measurement such as performance test, skill test, analytical thinking test, etc. It is therefore, not out of place to describe academic achievement as the gain in knowledge of students as a result of taking part in a learning activity or programme. Learning here refers to changes in a person's behavioural repertoire rather than just a change in behaviour.

Academic achievement is a result-oriented construct that encapsulates the extent of performance of a desired task. (Bello, 2022). Bello argued that since academic achievement is a measure of students' success in an academic setting, it is therefore, the goal of parents, teachers and school administrators to foster achievement. Nneji (2023) stated that students' achievement in computer studies, just like every other school subjects is usually done using assignments, projects, tests and examinations. These achievement measurement tools are used to assess (evaluate) the worth of the students' learning and as well predict their future academic endeavors. In this study, students' achievement in computer studies shall be measured using the Computer Studies Achievement Test (CSAT). Agogo (2023) affirmed the validity of the use of achievement tests especially in research studies designed to determine the effectiveness of two or more instructional strategies and or methods.

Similarly, Harry (2022) advanced that the major advantage of use of achievement tests is that apart from estimating the relative effectiveness of an innovation, achievement tests also identify areas of weaknesses in innovative techniques, thereby paving way for remedial action(s). This study therefore, shall not only use the computer studies Achievement Test to infer on the efficacy of the methods under study, but shall as well use its results or findings to proffer veritable ways of maximizing the use of those teaching methods in circumstances where any of them becomes the most appropriate. Kofi (2019) identified some factors that could determine students' achievement. They include teacher-qualification, teacher's knowledge of the subject matter and ability to deliver effectively, environment, students' state of mind,

students' readiness, teaching method, availability, utilization and suitability of instructional aids and teacher motivation.

In the same vein, Onovo (2022) grouped the factors under three broad sub-headings viz; teacher-related, student-related and environmental factors. Further-more, Onovo classified the factors as follows; Knowledge-oriented, economic-oriented, psychological and environmental. The list is endless. However, this study shall restrict itself to only teaching method as a determinant of students' achievement. Hence, concerted efforts shall be made to ensure that any observation made in the students' achievement can genuinely be attributed to the treatment administered. In specific terms, this study intends to ascertain the effect of meta-cognitive strategy on students' achievement in computer studies.

Concept of Retention

Retention as defined by Ngoma (2019) is the act of "absorbing and holding" or "to continue having or holding". Kuntu and Pedro (2020) asserted that failure to provide enough applications to real life activity and social usage cum poor teaching techniques are strong limiting factors to students' retention in computer studies. Similarly, Gbenga (2021) contended that for improvement of retention of learned materials in computer studies, programmed learning is indispensable. Retention, thus, depends mainly on teaching strategy adopted by the teacher. Retention and memory can hardly be separated. This because anything retained is stored in the memory. Sometimes people who retain poorly are said to have poor memories. Memory and learning are so closely related in meaning and functions that sometimes they are used interchangeably. For example the definition of Learning as adopted by most educators describes it as "a relatively permanent change in potential behaviour which is acquired through practice or experience.

The word "relatively permanent" in the definition connotes something stored or locked up somewhere and this is exactly what the memory is all about. Also the word "potential behaviour' implies something for a "later use" and this is the retrieval aspect of memory. Therefore learning implies memory and memory implies

learning Melky (2020). About memory, if there is any living organism that can use the past to live the present and shape the future that organism is human being. His capacity to store experience and retrieve it for use in daring situations places him above all other living creatures. According to Jebso (2019) memory is the storage and retrieval of things learned earlier. It is simply the ability or the power to store facts in the conscious mind and recall them for use in a later situation.

Jebso further enumerated the following functions of memory;

1. It allows the storage of information, that is, preservation of past experience.
2. It allows the retrieval of stored information for use when needed.

The other functions derive directly from functions 1 and 2 above.

3. It allows human beings to organize their lives
4. It saves people from danger through recognition
5. It places human beings above other creatures
6. It enhances our innovativeness and creativity through convergent and divergent thinking.
7. It allows human beings to control their lives.

On how the memory operates, Kuntu and Pedro (2020) stated that experience get stored in stages. Precisely they mention a sequential – three – stage process, starting with Sensory Register Short Term Store and then the Long term store illustrated by (the figure) adapted from Morgan et al (1979) and shown below;

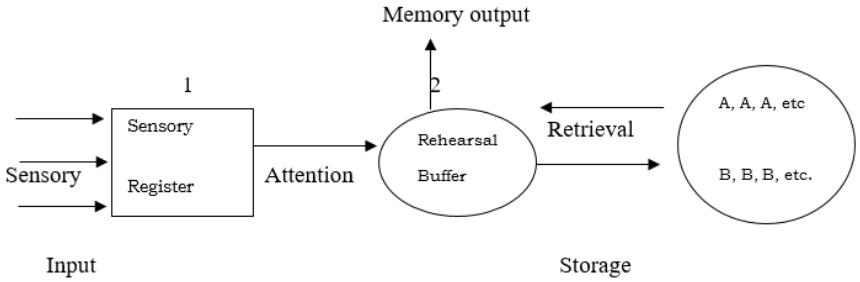


Figure 2: Morgan et al (1979) memory three – stage process model.

Stage 1: Sensory input is received. Here the sense organs of sight (eye), hearing (Ear), touch (Skin), smelling (nostril) and tasting (tongue) are active in the sense that they receive stimulation from the environment and briefly store it for about one to few seconds. In a nutshell, the sense organs are the Sensory Registers for sensory inputs from the environment. The sensory register receives, processes and sends to the second stage. The processing done by the sensory register is simple giving attention to the input. Any input not giving attention is ignored, discarded, or forgotten. It is only those held briefly for one to few seconds (attended to) that are pushed to the next stage.

Stage 2: the second stage is the short term store or short term memory. As soon as the input is received from sensory register (stage 1) the short term store processes it by rehearsing it. This is why this second stage is referred to as rehearsal buffer. It is holding stage where input is held for about 30 seconds. To rehearse is to repeat over and over. After rehearsal, the information in input is pushed to the third stage which is the long term store. For information to pass to the third stage, it has to be processed, that is, rehearsed, if not, such information is lost or forgotten.

Stage 3: This stage belongs to the Long-term store. It receives well rehearsed information form the short-term store. Its function includes receiving and organizing information into categories. This categorization could be done alphabetically or chronologically. Such as all A^s together, all B^s together, all C^s together or in the order of 1,2,3,4,5 etc. The Long term memory can hold information for days, for weeks, for months, for years or for life time.

In the words of Sapre (2023), it is a fact that our memory (LTM) has a tremendous capacity for encoding information. But then, how do we know that something at all is in our memory. This is done by measuring retention. According to Onovo (2022) we measure retention through:

Recognition, Recall and Relearning

In recognition a correct answer within other answers is presented to a subject (a person) who is expected to recognize and select the correct answer among the available. In recall subjects or respondents are not presented with any answers at all, whether right or wrong. They are expected to supply the answers. While in relearning if a subject is to relearn already learned materials, he is expected to relearn this same material using lesser time than when he first learned it. The time saved (saving time) is result of practice effect. It is measured thus:

$$\text{Saving Time} = \frac{\text{Original Learning Time} - \text{Relearning Time}}{\text{Original Learning Time}} \times 100$$

The retention here is the time saved in relearning. Kofi (2019) added a fourth one as reproduction. He explained reproduction as a measure of learning (retention) that involves remembering accurately in order to recall verbatim. Kofi further explained that retrieval fit is possible because it is aided by retrieval cues. The cues play the role of reminders. For example chair could be a retrieval cue for table, soldier a retrieval cue for war, husband for wife and rice for stew. Royal (2018) submitted that the retrieval cue or reminder to be effective, it should be coded with the learned

material at the point of learning. This approach he described as "encoding specificity principle." It should be noted that people tend to provide their own retrieval cues even when non is readily available.

Another submission by Kelvin (2019) say retrieval is possible through "tagging" and "cueing." This theory, - generation, recognition or tagging theory – says a tag is giving to an item to be remembered at the time it is being encoded for storage in LTM. The retrieval process starts with a cue. This cue makes us to generate a search for the tagged item through the portion of memory to which we have been directed by the cue. The COMSAT used to measure retention in this study perfectly combines the recognition, recall and reproduction techniques expounded above. Undoubtedly, what is not retained is forgotten. It follows therefore, that we cannot not explain retention fully without the mention of forgetting.

Curve of Forgetting

The general pattern of loss of retention according to Ekpe (2022) is the greatest loss that occur immediately after acquisition with the rate of loss diminishing after that. This has come to be known as curve of forgetting.

The figure below amply illustrates this.

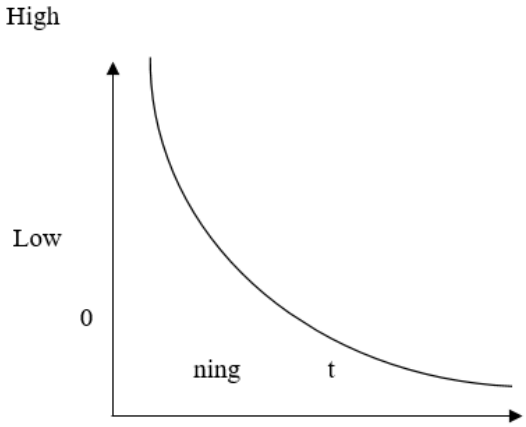


Figure 3: Herman Ebbinghaus Curve of forgetting model.

On Problems in Retention, Eze (2020) wrote that two major problems exist concerning our effort to retrieve learned materials from long term memory. They are: Tip-of-the-tongue phenomenon and Confabulation and These two problems make retrieval difficult. In Tip-of-the-Tongue Phenomenon sometimes we try to remember something e.g. a name. We have such names at the tip of the tongue but not in the memory. The name keeps going back. We may sometimes remember the starting alphabets Fa…….. something or sometimes the sound of the name. This is what Bell and Thompson described as the tip-of-the-tongue phenomenon.

They explained that confabulation**:** Is due to over-excitement or high motivation to remember something. In the process we excitedly manufacture a report that seems appropriate and we tend to believe it to be true, whereas it is false or wrong. Confabulation is therefore facts mixed with fictions which is believed to be true. Everyone confabulates to some extent. We have the ability to close gaps in perceptual situations. Therefore we simply get few key features and fill in the rest. These two problems of retention discussed above, (Tip of the tongue phenomenon and confabulation) are very vital especially in the use of Chatbots used in this study. This is because the major interest of this study was to proffer solutions to problems of retention that is, finding out ways of improving retention or memory.

Gender influence on use of Chatbots

Gender plays a significant role in shaping students' behavior, particularly in their career choices and subject preferences. Ayuba (2022) defines gender as the biologically determined characteristics distinguishing males and females, such as reproductive anatomy. Beyond biology, Ayuba presents a broader analytical perspective that outlines societal expectations and role responsibilities assigned to each gender. He characterizes male traits as bold, assertive, tactful, and economical in speech, whereas female traits are described as gentle, timid, submissive, and more expressive. Similarly, Onovo (2022) observed that within school settings, male students tend to gravitate toward challenging subject areas such as the sciences, while female students often prefer career

paths that align with traditional roles related to marriage and motherhood. These gender-based orientations may significantly influence students' academic engagement.

It is evident that teachers may inadvertently reinforce gender stereotypes by treating male and female students differently, including offering distinct career guidance based on gender. This differential approach contributes to the perpetuation of gendered expectations within educational settings. Research has consistently highlighted gender-based disparities in how students perceive and engage with technology. For instance, Sapre (2023) found that male students generally exhibit a more favorable attitude toward technology compared to their female counterparts, although some studies report no significant gender differences. Notably, female students tend to approach technological advancements with greater caution and critical assessment. Eze (2020) conducted a comprehensive analysis revealing that male students typically demonstrate higher levels of belief in the societal benefits of technology and greater self-efficacy—defined as confidence in their ability to effectively use and master technological tools—than female students.

In the broader context of education, gender bias embedded within artificial intelligence (AI) systems poses a serious concern. AI-driven dropout prediction models, which influence decisions about university admissions, may disadvantage female students if the algorithms are not gender-neutral. Thompson (2019) warns that such biases can result in reduced opportunities for female learners due to inaccurate predictions. Furthermore, Zest (2021) reports that some AI models have been found to rank intelligence levels along gendered lines, further exacerbating inequality in educational outcomes.

School location influence on use of Chatbots

Location in the context of this study will be categorized into two viz; urban and rural. The emergency of urban congestions has worsened things and created more unmanageable social problems. The problems of urbanization are many and they constitute a big threat to teaching and learning in Nigerian school. This is because

learning must take place in very conducive environments, (Gbenga, 2021). Undoubtedly, urbanization and rural development still pose great challenges to the government of the third world countries such as Nigeria. In the urban areas, barely all the basic infrastructures are inadequate in supply, hence, the struggle for and consequent over stretching of the available few. Therefore, in school system, the story has remained that of over-crowded classrooms, insufficient and obsolete equipment, absenteeism occasioned by the use of school children for street trading even during the school hours, truancy on the part of the teachers as they hassle to survive the high cost of living, etc, (Uyi, 2023).

On the other hand, the situation in the rural areas is not in any way better. Although the rural locations may never be known for over-population, they have definitely suffered neglect and abandonment. Hence, schools in the rural areas are marked by dilapidated buildings, where they even exist at all and lack of necessary equipments to enhance teaching and learning, (Ngoma, 2019). Many rural schools have been deserted by teachers who usually seek transfers to urban areas. All these largely tell on the learners who are the most vulnerable. Thus, a study of this nature is most timely as it also seeks to investigate whether location can affect teaching and learning of computer studies using Chatbots, (Ekpe, 2022).

Chatbots hold great potential to bridge learning gaps if implemented thoughtfully. Offline-compatible chatbot platforms, local language integration, and teacher training could help overcome location-based barriers. Ultimately, the success of chatbots in education depends not just on geography, but on how well the technology is adapted to the realities of each learning environment.

Empirical studies on the effect of location on students' achievement in computer studies have yielded conflicting results. Moreso, when the students are taught computer studies with instructional aid such as Chatbots. Research evidences such as (Zest, 2021 and Larry, 2023) have shown no significant effect or interaction between location, teaching method and students' achievement in computer studies. Conversely, Kelvin (2019) and Melky (2020) in their various studies indicated location as a major

player in students' achievement in secondary school computer studies. The gap created by these conflicting results is one of the challenges intended to be addressed by this study.

School type influence on use of Chatbot

The term "ownership", according to Uyi (2023), is the act, state or right of possessing. In this study, school type is categorized into two, namely, public and private schools. Public school here refer to all secondary schools owned, funded and overseen by either the local, state, or federal government. Private schools refer to all secondary schools owned, funded and overseen by a private proprietor which may be either an individual, group of persons, religious organizations or any other non-governmental organizations, (Ojim, 2021). It is important to clarify that some secondary schools run by some government departments or parastatals either as staff's children school or as a business enterprise are not directly funded and overseen by the government, hence, such schools are also classified as private.

In Nigeria, such schools include police children school, POWA and NOWA schools, university staff schools, etc. Gbenga (2021) submitted that over the years, secondary school ownership in Nigeria has generated lots of concern to educators and various tiers of government. Gbenga further held that education generally was a religious bodies' or missions' affair in Nigeria, until the government took over schools with reasons that the missions were running the schools below standard. In the same vein, Adejumo (2022) narrated that when the government took over schools in the pre-independence era, Nigeria had practically only one type of secondary general education, represented by the relatively few secondary grammar schools conducting a six-year course similar to those in the United Kingdom and leading to the Cambridge school certificate. Ayuba (2022) reported another development when secondary education was divided into three, viz' a government sector, an assisted sector and a non-assisted sector.

The government sector constituted an important part of the whole system and after independence was considerably enlarged. It included a number of secondary grammar schools and those schools

which were established as experiments. The assisted sector comprised part of the local government and private sectors receiving assistance through the grant-in-aid system. The remaining schools constituted the non-assisted sector the assisted sector included grammar schools, which were in the majority, some commercial schools in the West and Lagos, and the girls' modern schools in the East and Logos. The non-assisted sector included all modern schools in the west, a good number of grammar schools and almost all commercial schools, (Tenty and Awe, 2021). The National Policy on Education (2004) also states that government welcomes the participation of voluntary agencies, communities and private individuals in the establishment and management of secondary schools.

Hence, the practice today is that private individuals, private associations or tier non-governmental agencies can operate schools according to their own principles, as long as they comply with certain government requirements. For public or government secondary schools, the present practice all over the federation is that the state governments own (fund and oversee) the secondary schools in their territories apart from the federal government colleges funded and overseen by the federal government, (Eze, 2020). The financial burden of owning the secondary schools is weighing down so many state governments, especially the non-oil producing states. Consequently, so many state governments tend to shy away from this major social responsibility of the state to her citizens. Thus even some state governments' decision to return some schools back to their original mission owners has been widely criticized as government strategy to shy away from their legitimate social responsibility (Jebso, 2019).

According to Nwankwo (2021), as the cry of falling standard in Nigerian educational systems increase, parents and guardians seem to believe that private schools is the solution, not minding that the major allegation that led to government take-over of schools from missions was that they operated the schools below standard. Evidently, the rate at which private schools spring up in almost every street, today tend to suggest that the business in incrative. Almost all uncompleted buildings and church premises are

converted to private schools, mindless of the high cost when compared to public schools, (Akiri, 2021). Ngoma (2019) reported that many private schools use unqualified teachers to run their schools. Specifically, some of the private schools use secondary school learners to teach in secondary schools. Sapre (2023) alleged that many private schools' environment are not conducive for teaching and learning and that many examination malpractice centres, so called "miracle centers" are traced to some private schools.

In public schools, things may not be different because facilities are vandalized, dilapidated and neglected. Also teachers play truancy and instructional materials are either non-existence or obsolete. From the fore-going, it becomes obvious that more investigations such as this work is very timely to look into the factor of school ownership with regards to students' achievement in computer studies.

CHAPTER 6

Topic:

PRINCIPALS' MANAGERIAL PRACTICES AS DETERMINANT OF TEACHER PRODUCTIVITY IN SECONDARY SCHOOLS IN ENUGU STATE, NIGERIA

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Principalship

Itoya (2019) averred that the concept of principalship can best be understood with reference to who a teacher is. Itoya argued that since principals are made from among high ranking teachers, the definition of the term principal must stem from the definition of a teacher. In discussing the concept of principalship in this work, therefore, the definition of a teacher is of utmost usefulness. Otobo (2017) defined a teacher as one who is involved in the guidance of pupils through planned activities to enable them acquire valuable skills while reflecting on their experiences. Amusan (2017), defined a teacher as a person who helps someone to learn. Udoh (2017), posited that a teacher is one actively involved in a systematic, rational and organized process of transmitting knowledge and skills in accordance with professional ethics and principles. As Itoya (2019) stated, it is from high ranking teachers in secondary schools that principals are selected. Ikechi (2020) then defined a principal as a teacher promoted to a management position and given the task of being in charge of a secondary school.

Udoh (2017) held that the principal is the administrative head of a secondary school. The principal leads the management team of a secondary school. The principal should be regarded as an

administrator and by extension the school administrator can be regarded as a leader. Udoh explained that this is because the administrator (principal) performs certain functions that make the school to be effective. Such functions involve planning, organizing, directing and controlling. Amusan (2017), hinted that principalship involves identification of the vision, mission, strategies and objectives of secondary school well being in advance and provision of means of accomplishing them. The principal undertakes short, medium and long term planning as a foundation range planning.

Moreso, Amusan (2017) stated that principalship involves the control of human and materials resources of the secondary school. Amusan contended that since the principals sit at the helm of affairs or the top of the management or administrative ladder of the secondary school, the principal should be seen as a leader, the executive head, supervisor, manager, school climate developer, change facilitator and the Chief Servant. Evidently, one of the most frequently discussed aspects of principalship is leadership. Shehu (2018), defined a leader as a person who shows the way and influences someone else to think in a particular way. This implies that a leader knows the way, shows the way, goes the way and influences other people to do same.

Shehu further defined principalship as the mobilization of group efforts towards the achievement of stated goals in a secondary school. Principalship, thus, is the capacity to coordinate many and often conflicting social energies in secondary schools, so adroitly that they operate as a unit. Adeleke (2019), collaborated this with the definition of principalship as effective coordination of resources and people's efforts for the achievement of the goals of secondary education. Pedro (2019) opined that principalship entails ability to manage or economize available scarce resources through careful control, regulation or supervision of all activities in secondary schools. Principals' activities includes overseeing and monitoring enrolment of students, attraction of best staff, conducting teaching, learning and research as well as graduating secondary school students in an effective and efficient manner. In the course of carrying out his duties, a principal may wish to lead by giving information, suggesting alternative courses of actions and trying to

stimulate self-direction in the people he leads. In this case, the principal is said to adopt a participatory leadership technique or a democratic leadership style (Lee, 2018).

Contrarily, Dapang (2018) further stated that when a principal sees constructive and objective criticism as a threat, and fails to give the people he leads a chance to make input to decision making, the principal is said to be autocratic. A third type is where a principal primarily supplies the materials for decision making and grants his subordinates unrestricted freedom to make decision. Here, the principal is qualified as a care-free or laiz-affair leader. Dapang therefore adviced that effective and efficient principalship demands stricking a fruitful or productive balance. Democracy and autocracy can be balanced in such a way that rule and order are maintained. The works go on, the workers are happy and the organizational goals are attained. Al-Jaradeen (2019) recommended that any principal who will succeed must pay more attention to personnel management. This is because personnel management is all about human resources development. Human resource no doubt, is the most essential of all the resources for development in any organization, most especially an organization such as secondary school whose raw materials are humans.

Frankly, when human resource is put in place in any organization, all other resources can be substantially harnessed. Al-Jaradeen further asserted that entire goal of secondary school is human development. When a secondary school staff or personnel is developed, the ultimate beneficiary is the student. It therefore follows that when the principal, through good personnel management practices develops the staff, the students will reap maximum benefits from it. From the foregoing, the advice of Yong (2017) is very useful to all secondary school principals. Yong submitted that principals should not restrict themselves to overseeing or inspecting and monitoring workloads, equipments, finances, materials, people, time, etc. rather the principal should have a wider picture of the school. As an administrator or a manager, the principal should be visionary. Yong averred that a principal's vision for his school should have three components namely; hindsight, insight and foresight. Through the hindsight, the principal

sees the past, through the insight, he sees the present and through the foresight he sees the future of the school. Summarily, the managerial practices in secondary schools should constitute major training hints for principalship. Principalship is hinged on managing persons (staff and students), who in turn help in managing other resources or materials for effective productivity of the overall goals and objectives of the secondary school. Henshaw (2019) identified five major principals' managerial practices that could relate with teacher productivity. These principals' managerial practices include internal supervision, performance appraisal, staff training, staff welfare and enforcement of discipline.

Internal Supervision

The importance of school supervision in today's educational system demands for greater attention and becoming more conscious now than in the past about the importance of education in general and thus have generated interest in the daily operation of the school systemic particular. For a very longtime, instructional supervision has always been regarded as an essential process as Obasi (2018) put it whether students', teachers' administrators or supervisors are individuals of worth, endowed with unique talents and capacities. It is through the process of supervision that these talents are stimulated. According to Kuntu (2020), supervision can be said to be gathered efforts of designated school officials towards providing leadership to the teachers and other educational workers in the improvement of instructions. By this definition, supervision of instruction takes care of all that is undertaken in the school to facilitate learning. The consideration is on educational institution to provide learning facilities, way of raising the morals of teachers, conditions service and security. Supervision of instruction is also seen by some scholars as a phase of school administration. Henshaw (2019) refers to supervision as "one of the techniques of educational administration necessary for the achievement of educational objectives".

The need for supervision of instruction in all educational institutions cannot be over emphasized without adequate supervision of instruction, no effective learning can take place since

interest to learn and to teach is stimulated through supervision. The importance of supervision of instructions has been recognized all over the world. Consequently, all ministries of education in Nigeria for instance, have supervisory division attached to them. To bring about improvement in learning, supervision must concern itself not just with teachers alone, but also on all other considerations which may affect their performances. Nevertheless, supervision is the focus of this study (Ajom, 2018). It has been discovered that teachers usually have greater potentials or ability to work when supervised than they usually, do. Some teachers are fully determined to work but for certain reasons, productivity is often low. These reasons may include such things as low and irregular payment of salaries, poor conditions of service to teachers, climate, poor equipment and the like. According to Jida (2017), effective supervision tends to assuage those bitter conditions and motivate both the teachers and the learners.

Supervision goes hand in hand with motivation. The performance of motivated teachers is not sporadic like eye service and cannot be maintained by the use of force but will be observed in the dedication of the teachers to work in the absence of the boss. Some writers have seen the supervisory process as interpersonal in nature. Raphael (2018) asserted that supervision operationally focuses on a dynamic relationship where in one person (the supervisor) tries to help other person (the teacher) improve the way he/she is teaching. Raphael continued by saying that supervision is a process of change. The supervisor is the changing agent whose responsibility is to provide the variety of resources that may be necessary for the teacher to see the need for change, to plan to change, to enact new behaviour and to test out its effectiveness. This description has more or less given supervision a new dimension as an object for change. At times, people are not aware of what they are doing. The nature of supervision affords individuals an insight into all these. To buttress this, Maris (2017) sees internal supervision as an appraisal or in-school evaluation of the students and staff by the school to help with its decision making and the professional development of its staff.

Supervision should also be seen as related teaching effectiveness. Clauss (2018) noted that a new approach to supervision that include scheduling meetings and collaborative enquiry proved to be effective to teacher's performance as against laymen in the early 19th century. Modern supervision therefore makes use of meetings as a method of improvement. Indeed, a lot of authors have acknowledged the fact that there has been a change in the mode of supervision. According to Zippoh (2019) supervision today has taken a new look. It has been a skilled and specialized service rendered to teachers through the ministry of education and the head of each school within the system. Zippoh continued by saying that teachers nowadays receive prior notice before they are visited. Zippoh summarized modern supervision as being positively oriented and democratic in approach. It also promotes the spirit of finding out facts through experimentation and continuous evaluation. The above definition has to do with the modern supervision and research. A method of using supervision to investigate critically the hypothetical assumptions about teaching and learning, (Kyap, 2019).

The modern supervision therefore recognizes the capabilities of their personnel in the job of providing guidance for improved teaching and learning. Zeph (2020) had this to say of some of the personal qualities of a supervisor; His intuition, humility, friendliness, thoughtfulness, sense of humor-his effect on others as well as his patience are essential characteristics because supervision deals with relationship between people. So one can conclude that his effectiveness depends on his understanding of human behaviour. Few also went on to say that a supervisor should be a person who has high native intelligence and a broad grasp of the educational process in the society, he should have love for children and an abiding interest in them and their learning problems, he should be an expert into democratic group process as all their qualities will help him to develop and understand good human relations which are vital in modern supervision as a means of improving teaching and learning situations in schools.

The supervisors qualification. In the old days, supervision was carried out by a number of persons who had no professional

qualifications no wonder they acted as fault finders, spreading wavers of anxiety and tension to the entire school environment such that the principals, teachers and students remained constantly on edge throughout the period of supervision and only to have a sigh of relief at the departure of the supervisors, Jack (2016). In Nigeria today, Otobo (2017) averred that where there are many ethnic groups and different religious adherents such as Christians, Muslims animists, the possession of a broad education by the supervisor helps him to be tolerant and empathic in the principal's advisory functions in schools. Continuing, Otobo contended that the supervisor of schools should possess adequate professional education or qualification, which include Higher Elementary Certificate or Grade Two Certificate, Nigerian Certificate of education, Bachelor of Arts/Science in Education, Master of Education. Consequently, personal qualities of the principals can affect their supervision which is the focus of study.

Staff Performance Appraisal

According to Charles (2020) employees need to be appraised and evaluated from time to time to enable management identify individual differences and have a rational basis for constructing a bonus merit system. Jack (2016) opined that appraised dimensions and standards can help to implement strategic goals and clarify performance expectations. Adeleke (2019) gave two reasons for conducting job evaluation or performance appraisal. The reasons are;

i. To improve the management of staff resources by helping employees realize and fully utilize their potential while striving to achieve organizational goals, and

ii. To provide managers the information necessary for decision making in several areas of personnel management. For example promotion, training, discipline and so on.

In the same vein, King (2019) extended the reasons for performance appraisal to four, namely;

i. To provide systematic judgments to support salary increases, promotions, transfers, demotions or terminations.
ii. To provide a means of telling subordinates how they are doing and of suggesting needed changes in behaviour, attitudes, skills or job knowledge;
iii. To allow subordinates know where they stand with the boss and
iv. To furnish a useful basis for the coaching and counseling of individuals by supervisors.

Yong (2017) listed job evaluation or performance appraisal criteria to include foresight, penetration, judgment, oral expression, relations with colleagues, relations with public acceptance of responsibility, reliability under pressure, drive and determination; application of professional/technical knowledge, output of work; quality of work; punctuality, etc. According to Maris (2017) numerous other techniques abound in literature for measuring and appraising staff. This is more so because the question of what to appraise in any worker varies from one organization to the other, as well as from job to job. In addition, while some organizations conduct performance appraisals for administrative purposes others do so for development purposes.

Administratively, performance appraisals are used whenever there are the basis for a decision about the employee's work conditions, including promotions, termination and rewards. Developmental uses of appraisal, which are geared towards improving employee's performance and strengthening their job skills, include counseling employees on effective work behaviours and sending them for training. Another veritable tool for job evaluation and performance appraisal is supervision. Generally, supervision is concerned with facilitating, directing and monitoring the work of others to accomplish organizational and individual goals and objectives. A supervisor, in a wider application, could be a team leader, foreman, unit head, operating manager, sector manager, shift

leader, or branch controller. In secondary schools, apart from external supervisors. The principal leads every internal supervision. The principal may, however, delegate supervisory, roles to vice principals, deans, subject heads, unit heads as chief security, director of works etc. in essence, improvement in any activity, especially in secondary school system is based on periodic criticisms, clarifications, verifications and justification of some of the existing activities. This is the philosophy underlying supervision in schools.

Zeph (2020) warned that whatever the appraisal instrument or evaluation techniques used, the principal must ensure an unbiased and fair judgment of all staff, irrespective of sex, age, status, ethnic or religious affiliation. Zeph added that if well utilized, assessment and recognition of performance levels can motivate workers to improve their performance. In Enugu state, staff promotion in secondary schools is approved by the post primary schools management board (PPSMB) but the principals make valuable inputs. Principals grade or score their staff, principals recommended who should and who should not be prompted. Principals form major parts of most promotion panels. Infact, the PPSMB mainly endorses or rejects the evaluation or appraisal just as the PPSMB is the eye and voice of the state government. The principals do same for PPSMB in secondary schools through the PPSMB Zonal offices. Principals summarily grade the teachers and other staff using the Annual finance Appraisal (APA) form.

Staff Training and Development

Another vital managerial practice is staff training and development. Henshaw (2019) alleged that many heads of organizations erroneously think that they have nothing to gain from staff training and development programmes. This is because it costs some organizations so much to train and retrain their staff. However, Henshaw hinted that staff training and development benefits organizations maximally as it improves and enhances workers' productivity and dedication. Henshaw therefore defined staff training and development as the process of developing qualities in human resources that will enable them to be more productive and thus contribute more to organizational goal achievement. Staff

training and development vary in type and extent and according to the nature and skills of the jobs involved, as well as the experiences of the employees concerned.

Kuntu (2020) defined staff development as the process of increasing the knowledge, skills and capacity of the staff in the organization for promoting its economic, political, and social or any other desired growth. Kuntu contended that the best staff training and development programme for a secondary school is on the job training. Ojunta (2019) suggest five on-the-job training methods that may be very useful. They are;

1. Coaching, that is, the trainee is put under the guidance of an experienced employee who shows the trainee how to do the job;
2. Job rotation, that is, the trainee in given several jobs in succession so as to gain experience on wide range of activities.
3. Temporary promotion, that is, an individual is promoted into his/her superiors position whilst the superior is absent, due to some reasons. This gives the individuals of a more senior position;
4. Assistant to, that is, a junior officer with good potentials may be appointed as assistant to another top officer in this way, the individual gains experience of how the organization is managed at the top.
5. Committees, that is, trainees might be included in the membership of committees to enable them to gain an understanding of inter-departmental relations.

On the objectives of staff training and development, Jida (2017) stated that training aims at equipping the workers with the necessary skills to enable them remain employed, to gain promotion and to have reasonable expectation of re-employment in the event of their being made redundant. Adeleke (2019) addressed that since staff training and development aim at increasing the productivity of employee by influencing their behaviour, concerted efforts should be determined, adequate training programmes designed and training evaluation administered. The first step in the training process is the

determination of training needs. It involves the information or skill areas of an individual or group that requires further development in increasing the productivity of that individual or group. It should also be noted that the training or organization of members is typically a continuing activity, to the extent that even employees who have been with the organization for sometime and who have undergone initial orientation and skills training need continuous training to improve their skills. After determining the training needs of the workers, the personnel manager now designs a training programme aimed at meeting those needs.

According to Amusan (2017) orientation is the process of informing new employees about what is expected of them in the job and helping them to cope with the stresses of transition. Hence, training of the employee begins with the orientation programme. Orientation involves introducing and guiding the new employees to the organization and the various units. It is important that new employees become familiar with the organizations policies, procedures and performance expectations. Staff training and development may involve refresher courses, sandwich or part time courses, full time sponsored courses, attendance of workshops, seminars and conferences that build capacity. Principals play vital roles in staff training development starting from recommending staff that should be trained or staff that should benefit in any form of development to serving as resource persons in capacity building workshops, seminars and conferences. Some principals are also consultants in various academic professional bodies that train secondary school staff.

Staff Welfare

Staff welfare is another vital variable which must not be toyed with if the objectives of secondary schools must be achieved. It is stating the obvious, to say that a well-motivated workforce is that whose welfare are given priority by the employees. Itoya (2019) submitted that staff welfare can summarily be seen as the social responsibility which, all employers owe other workers. Yong (2017) summarized the social responsibilities, which all employers owe to workers as: provision of heavily subsidized food, uniform, medical

treatment for him and his family, transportation to and from work, pay for accommodation, payment of school bills for at least one of his childern, provide facilities for recreation, prepare him for retirement through counseling and provision of relevant facilities, visit him at home when sick and when he dies, announce his obituary with fun-fare and bury him decently while ensuring his dependants don't suffer.

Unarguably, when these social responsibilities are met, the multiplier effect could be to elicit job satisfaction with positive externalities on workers' efficiency, productivity and commitment. Little wonder why King (2019) enumerated the purposes of welfare services as:

i. Provide personal advice and assistance to individuals and
ii. Encourage a positive relationship between the individual and the organization by providing extra security and comforts.

Evidently, welfare of staff is very germane in every organization and any organization that neglects staff welfare, cannot get higher productivity from the labour force. A very useful tool with which a secondary school principal may meet his staff's welfare is cooperative society or cooperative union. Dunga (2018) defined a cooperative society or union as an autonomous association of people united voluntarily to meet their common economic, social cultural needs and aspirations through a jointly owned and democratically controlled business. Adeleke (2019) similarly defined cooperative society or union as a jointly owned enterprise engaging in the production or distribution of goods or the supplying of services, operated by its members for their mutual benefits. Cooperative business are topically more economically resilient than any other form of enterprise.

Cooperative date back as far as human beings have been organizing for mutual benefits. Tribes were organized as cooperative structures, allocating jobs and resources among each other, only trading with the external communities. A broader definition was given by Amusan (2017) as a non-profit community

organization and businesses that are owned and managed by the people who use their services (a consumer cooperative) or by the other people who work there as cooperative) by the people who line there as (a housing cooperative) and hybrids such as worker cooperatives that are also consumer cooperative or credit unions. There are also multi-stake holder cooperatives such as those that bring together civil society and local actors to deliver community needs and second and third tier cooperatives whose members are other cooperatives.

Traditionally, cooperatives combine social benefits interest with capitalistic interest. Cooperatives achieve a mix of social and capital purposes by democratically governing distributions by and between equal controlling members. A secondary school principal, can therefore enhance staff welfare through staff cooperative unions. Such cooperative union can among other things run thrift and soft loan schemes. From experiences, so many secondary school staff cooperatives in Enugu State, make bulk purchases of essential commodities and share among members. Also so many teachers have purchased landed property through the help of cooperatives. Interestingly, some cooperatives retain their members even after retirement.

Enforcement of Discipline

The word "discipline" has been variously defined, Ikechi (2020) defined discipline as practice of making people obey rules and orders, or the controlled situation that results from this practice. Tambo (2018) refers to discipline when students are taught to respect the school authorities, to observe the school Laws and regulations and to maintain an established standard behaviour. Discipline therefore connotes politeness, acting with decency and decorum, not out of fear of punishment, but out of a high sense of responsibility. A disciplined, student loves orderliness, obeys rules and regulations of the school. He can be entrusted with major responsibilities and can demonstrate respect for authority. Discipline can also be described as being able to control one's behaviour and manner of working operations. A disciplined

individual does good simply because it is good to do good, not in the hope or expectation of some rewards.

Discipline is of vital importance in the school system because without discipline teaching and learning will be impaired. Stressing this point, Maris (2017) held the view that children need discipline, want discipline and would be insecure without discipline. Udoh (2017) conceived discipline primarily as systematic training, through education or as a mode of life in accordance with the rules of the society. Obasi (2018), conceived discipline as punishment or enforcing obedience or orderly conduct or motivating pupils to take responsibilities with trust and confidence. The modern concept of discipline is more of staff-control. An individual has self-discipline when he can set a goal for himself and make whatever sacrifice and efforts it takes to obtain it. The goal of school discipline is to build a level of self-control so that proper habits will be followed without the use of authority. Self-control will provide the appropriate atmosphere for work in the various school locations and situations (Ojim and Nyim, 2018).

Experts in education are of the opinion that as it concerns discipline, the emphasis today is on developing permanent educational values rather than on maintaining order in the school, on training boys and girls to desire to be acceptable and useful beings rather than destructive and harmful one's, on training an individual to govern his own conduct rather than being dependent upon government or others. By implication, today's discipline on schools has more to do with inculcating in the individual the value which make him long to become a disciplined citizen. It is no longer in form of conditioned learning whereby the individual is forced by rules and regulations to conform to acceptable behaviour. Lee (2018) also viewed discipline as an attitude of mind which produce self-control obedience, adherence to norms in the absence of any sanction or supervision. Discipline can also mean readiness and prompt adherence to rules and regulations as occurs with the military.

In a school system, students are taught to respect the school authorities, observe rules and regulations and to maintain an established standard behaviour. In the same vein they are made to

see that lack of discipline generates unruly behaviour which could be regarded as any act which does not conform with the societal norms and values. Indiscipline is any act that is inconsistent with the established rules and regulations governing an institution. Dapang (2018) conceived indiscipline as a violation of schools' rules and regulations capable of obstructing the smooth and orderly functioning of the school system. This he said should be avoided through perfect orientation of students and imposition of positive sanction in cases of obvious violation of order.

With particular reference to school, Dapang wrote that discipline is to teach the students to respect the school authorities to observe the school laws and regulations and to maintain an established standard behaviour. Disciplined behaviour according to Shehu (2018) involved such characteristics as self-sacrifice, diligence, cooperation, integrity, truthfulness patriotism, consideration for others and sympathy. According to Raphael (2018) "discipline involves self-control, restraint, respect for self and respect for order. The disciplined person is guided in his behaviour, moral and social principles and does what is right and good. Clauss (2018) equally defined discipline as the readiness or ability to respect authority and observe conventional or establish laws of the society or of any organization". Al-Jaradeen (2019) went further to define discipline as the ability and willingness to do what one ought to do without external control. Prompting from these definitions, one can now define discipline as the voluntary and deliberate effort to submit oneself to established code of conduct and acceptable pattern of behaviour of a society so as to achieve mutual cooperation and general happiness for mankind.

Productivity

Productivity refers the efficiency of production of goods or services expressed by some measure. Measurements of productivity are often expressed as a ratio of an aggregate output to a single input or an aggregate input used in a production process, that is, output per unit of input, typically over a specific period of time, (Adikpe, 2017). The most common example is the (aggregate) labour productivity measure, one example of which is GDP per worker.

There are many different definitions of productivity (including those that are not defined as ratios of output to input) and the choice among them depends on the purpose of the productivity measurement and data availability. According to Adikpe, The key source of difference between various productivity measures is also usually related (directly or indirectly) to how the outputs and the inputs are aggregated to obtain such a ratio-type measure of productivity. High Productivity is a crucial factor in the production performance of organizations, firms and nations.

Increasing national productivity can raise living standards because increase in income per capita improves people's ability to purchase goods and services, enjoy leisure, improve housing, and education and contribute to social and environmental programs. High Productivity can also help businesses to be more profitable. High Productivity is a crucial source of growth in living standards. Productivity growth means more value is added in production and this means more income is available to be distributed, (Ogbonna, 2017). At a firm or industry level, the benefits of productivity can be distributed in a number of different ways: to the workforce through better wages and conditions, to shareholders and superannuation funds through increased profits and dividend distributions, to customers through lower prices, to the environment through more stringent environmental protection and to governments through increases in tax payments which can be used to fund social and environmental programs, (Taswir, 2019).

Productivity is important to any organization because it helps the organization to meet its obligations to workers, shareholders, and governments and still remain competitive or even improve its competitiveness in the market place. According to Taswir, more input may not necessarily increase the income earned per unit of input unless there are increasing returns to scale. Taswir argued that adding more input is likely to mean lower average wages and lower rates of profit. But, when there is increase in productivity, even the existing commitment of resources generates more output and income. Income generated per unit of input increases. Additional resources are also attracted into production and can be profitably employed. Technology has enabled massive personal

productivity gains. Technological tools such as computers, spreadsheets, social media, and other advances have made it possible for a knowledge worker to seemingly produce more in a day than was previously possible in a year, (Ikechi, 2020).

No doubt, teachers can be grouped under creative and knowledge workers. Drivers of productivity growth for creative and knowledge workers include improved or intensified exchange with peers or co-workers, as more productive peers have a stimulating effect on one's own productivity. Hilton (2020) observed that productivity may be influenced by effective supervision and job satisfaction. According to Hilton, an effective or knowledgeable supervisor (for example a supervisor who uses the Management by objectives method) has an easier time motivating their employees to produce more in quantity and quality. An employee who has an effective supervisor, motivating them to be more productive is likely to experience a new level of job satisfaction thereby becoming a driver of productivity itself. Nwankwo (2019) added that there is also considerable evidence to support improved productivity through operant conditioning reinforcement, successful gamification engagement, and research-based recommendations on principles and implementation guidelines for using monetary rewards effectively.

There are many factors that may lead to loss of productivity in an organization. Adog (2020) listed this factor to include, workplace bullying, workplace incivility, toxic work place and workplace psychopath. Workplace bullying results in a loss of productivity, as measured by self-rated job performance. Over time, targets of bullying will spend more time protecting themselves against harassment by bullies and less time fulfilling their duties. According to Adog, workplace incivility has also been associated with diminished productivity in terms of quality and quantity of work. A toxic workplace is a workplace that is marked by significant drama and infighting, where personal battles often harm productivity. While employees are distracted by this, they cannot devote time and attention to the achievement of business goals. When toxic employees leave the workplace, it can improve the culture overall because the remaining staff become more engaged

and productive. Adog added that the presence of a workplace psychopath may have a serious detrimental impact on productivity in an organization.

Teacher

The term teacher is derived from the word teach. The word teach has diverse applications. Broadly, to teach means to instruct, tutor, guide, direct, counsel, advice, correct, administer, mentor, supervise, inspect, plan, implement, rebuke, praise, motivate, etc. A teacher is, therefore, one who teaches or one who is trained and qualified to teach, (Ikechi, 2020). A teacher is an educator, an evaluator, an assessor, an examiner and a scholar. Informally the role of a teacher may be taken on by anyone (e.g. when showing a colleague how to perform a specific task). In some countries, teaching young people of school age may be carried out in an informal setting, such as within the family (homeschooling), rather than a formal setting such as a school or college. Some other professions may involve a significant amount of teaching (e.g. youth worker, pastor). In Nigerian and most countries of the world, formal teaching of students is usually carried out by paid professional teachers. In the context of this study, the term teacher refers to one who is employed to teach students in a formal secondary education settings.

Teaching is a highly complex activity. This is partially because teaching is a social practice that takes place in a specific context (time, place, culture, socioeconomic situation etc.) and therefore is shaped by the values of that specific context, (Adung, 2018). According to Adung, factors that influence what is expected (or required) of teachers include history and tradition, social views about the purpose of education, accepted theories about learning, etc. The competences required by a teacher are affected by the different ways in which the role is understood around the world. Broadly, Baro (2018) outlined four models: the teacher as manager of instruction, the teacher as caring person, the teacher as expert learner and the teacher as cultural and civic person. Baro argued that it is necessary to develop a shared definition of the skills and knowledge required by teachers, in order to guide teachers' career-

long education and professional development. Some evidence-based international discussions have tried to reach such a common understanding.

Three broad areas of competences that teachers require were identified by Baro (2018) as working with others, working with knowledge, technology, and information, as well as working in and with society. Scholarly consensus is emerging that what is required of teachers can be grouped under three headings: Knowledge (such as: the subject matter itself and knowledge about how to teach it, curricular knowledge, knowledge about the educational sciences, psychology, assessment, etc.), craft skills (such as lesson planning, using teaching technologies, managing students and groups, monitoring and assessing learning, etc.) and dispositions (such as essential values and attitudes, beliefs and commitment). Nathir (2019) reported that teachers who showed enthusiasm towards the course materials and students can create a positive learning experience. These teachers according to Nathir do not teach by rote but attempt to invigorate their teaching of the course materials every day. Teachers who cover the same curriculum repeatedly may find it challenging to maintain their enthusiasm, lest their boredom with the content bore their students in turn.

Enthusiastic teachers are rated higher by their students than teachers who did not show much enthusiasm for the course materials. Itoya (2019) opined that student motivation and attitudes towards school are closely linked to student-teacher relationships. Enthusiastic teachers are particularly good at creating beneficial relations with their students. Their ability to create effective learning environments that foster student achievement depends on the kind of relationship they build with their students. Itoya maintained that useful teacher-to-student interactions are crucial in linking academic success with personal achievement. Here, personal success is a student's internal goal of improving themselves, whereas academic success includes the goals they receive from their superior. A teacher must guide their student in aligning their personal goals with their academic goals. Students who receive this positive influence show stronger self-confidence and greater personal and academic success than those without these teacher interactions. Students are

likely to build stronger relations with teachers who are friendly and supportive and will show more interest in courses taught by these teachers.

Teachers that spend more time interacting and working directly with students are perceived as supportive and effective teachers. Effective teachers have been shown to invite student participation and decision making, allow humor into their classroom, and demonstrate a willingness to play, (Nathir, 2019). In many countries, a person who wishes to become a teacher must first obtain specified professional qualifications or credentials from a university or college. These professional qualifications may include the study of pedagogy, the science of teaching. Teachers, like other professionals, may have to, or choose to, continue their education after they qualify, a process known as continuing professional development, (Ikechi, 2020). The issue of teacher qualifications is linked to the status of the profession. According to Ikechi, in Japan and some countries, teachers enjoy a status on a par with physicians, lawyers, engineers, and accountants, whereas, in Nigeria and some other countries, the status of the teaching profession is low.

Teachers are often required to undergo a course of initial education at a College of Education to ensure that they possess the necessary knowledge, competences and adhere to relevant codes of ethics. There are a variety of bodies designed to instill, preserve and update the knowledge and professional standing of teachers. Around the world many teachers' colleges exist; they may be controlled by government or by the teaching profession itself, (Adog, 2020). They are generally established to serve and protect the public interest through certifying, governing, quality controlling, and enforcing standards of practice for the teaching profession. The functions of the teachers' colleges may include setting out clear standards of practice, providing for the ongoing education of teachers, investigating complaints involving members, conducting hearings into allegations of professional misconduct and taking appropriate disciplinary action and accrediting teacher education programs.

In many situations, teachers in publicly funded schools must be members in good standing with the college, and private schools may also require their teachers to be college members. In other

areas, these roles may belong to the State Board of Education, the Superintendent of Public Instruction, the State Education Agency or other governmental bodies, (Hilton, 2020). In still other areas, Teaching Unions may be responsible for some or all of these duties. A teacher's role may vary among cultures. Teachers may provide instruction in literacy and numeracy, craftsmanship or vocational training, the arts, religion, civics, community roles, or life skills. Formal teaching tasks include preparing lessons according to agreed curricula, giving lessons, and assessing student progress. A teacher's professional duties may extend beyond formal teaching. Outside of the classroom teachers may accompany students on field trips, supervise study halls, help with the organization of school functions, and serve as supervisors for extracurricular activities.

Teachers also have the legal duty to protect students from harm, such as that which may result from bullying, sexual harassment, racism or abuse. In some education systems, teachers may be responsible for student discipline. The teacher is at the center of the educational process generally and secondary education in particular. In fact, with the teacher in right place, every other resources needed in the secondary educational process can be properly harnessed. With reference to teacher productivity, Itoya (2019) noted that, the output of teacher performance manifests in students' academic achievement or performance, students' behaviour, students' interest in school, conduciveness of school environment, students' attainment in extracurricular and co-curricular events, school rating and the ultimate attainment of the laudable goals of secondary education. In summary, teacher productivity is the measure of the efficiency of the teacher in converting inputs into useful outputs.

Teacher Productivity

In organizations where the traditional hierarchy has been removed in favor of an egalitarian, team-based setup, the employees are often happier, and individual productivity is improved (as they themselves are better placed to increase the efficiency of the work floor). A secondary school teacher productivity can be ascertained by measuring the extent to which the teacher instruct, tutors, guides,

directs, counsels, advices, corrects, administers, mentors, coaches, supervises, inspects, plans, implements, rebukes, praises, motivates, educates, evaluates, assesses, examines, etc. A teacher may also be rated based on his formal teaching tasks such as preparing lessons according to agreed curricula, giving lessons, and assessing student progress. His productivity may also be assessed based on his professional duties that may extend beyond formal teaching these include accompanying students on field trips, supervising study halls, helping with the organization of school functions, and serving as supervisor for games, farm works, manual labors and other extracurricular and co-curricular activities.

Influence of principals' gender

Gender is an important variable in current researches in the field of education. In most states, female gender has imposing population in teaching profession. In Enugu state, many schools have female principals. This explains why gender is a factors in this study. Ajom (2018) asserted that gender refers to the socially, culturally constructed characteristics and roles which are ascribed to males and females in any society. Gender is a major factor that influences the students' behaviour including career choice and subject interest of the student. According to Udoh (2017), gender or sex refers to those characteristics of males and females which are biologically determined such as possession of the male and female reproductive genital organs. Udoh further gave a broad analytical concept which draws out female role/responsibilities in relation to those of males describing the male attributes as bold, aggressive, tactful economical use of words, while females are fearful, timid, gentle, dull, submissive and talkative. Maris (2017) alleged that in schools, males are more likely to take difficult subject areas like sciences, while the females take to careers that will not conflict with marriage chances, marriage responsibilities and motherhood and this may influence their study behaviour.

Evidently, teachers also, encourage gender stereotype by giving different treatment to males and females. Teachers go further to give different career guidance to males and females. The society frowns at seeing a man cooking or a female climbing a tree. Nigeria,

since she gained her independence had never produced a female President. To correct this abnormally, it is expected that the leading experiences offered to the children in schools should not discriminate against males and females. Gender discrimination cut across almost every sphere of lives of citizens of developing nations such as Nigeria. It is therefore not a surprise to hear secondary school teachers arguing that the role of principalship is gender sensitive and gender based. With this in mind, many secondary school teachers seem to believe that most managerial practices are characteristics of female while others are characteristics of male. It is against this background that this study intends to determine the extent to which both male and female principals adopt managerial practices for productivity in secondary school in Enugu state.

CHAPTER 7

Topic:

EFFECTS OF COMPUTER AIDED INSTRUCTION ON SECONDARY SCHOOL STUDENTS' INTEREST, ACADEMIC ACHIEVEMENT AND RETENTION IN COMPUTER STUDIES IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Computer-Aided Instruction (CAI)

Nneji and Ezeamaenyi (2021) defined computer as an electronic device which is capable of receiving information (data) and performing a sequence of logical operations in accordance with a predetermined but variable set of procedural instructions (program) to produce a result in the form of information or signals. Ezeliora (2022) described computer as an electronic automatic machines which is capable of receiving, storing, recalling or retrieving information put in it. In the same vein, Obianu in Olinya (2020) defined computer as a device for storing large amount of information called data, and processing these data in specified ways in very short period of time. To him, computer is a machine specifically designed for the manipulation of coded information; an automatic electronic machine for performing simple and complex operation far beyond the capacities of man.

Similarly, Osaisai (1996) in Rasaki (2023) defined computer as an electronic device that has the ability to accept data, internally store and automatically execute a program of instructions, perform mathematical, logical and manipulative operations on data, and report the result. To Hanks (2021), computer is a combination of hardware devices and programs, assembled to accomplish some specific tasks. The term "computer" will undoubtedly suggest a

machine used for computations, that is, mathematical calculations. This is certainly one of the functions of a computer, but to think of computers only as rather powerful calculating machines would seriously under- estimate the range of their possible applications. Computers today handle many tasks that involve little or no mathematical computations, and it is better to think of them as machines which handle information in a logical way.

Computer in its various forms has become an essential part of the learning process. Two different types of computer use in education could be identified: class use of computers and supportive use of computers. Class use of computers include computer as tool for presentation, encouraging students to train skills and instructing students in the possibilities of computers, while supportive use of computers include administration, preparing work sheet for the students, looking for information on the internet for lesson preparation, (Van- Braak and Valcke, 2022).

Onah (2018) differentiated between computer in Education, Computer Education and computer through Education as follows; computer in Education is about the use of computer or Information and Communication Technology (ICT) to facilitate education. This involves the application of computer into teaching and learning, from planning through implementation and up to the point of achieving learning objectives. Computer or ICT Education refers to computer or ICT as a subject of study, this requires proper planning for designing and implementing the curriculum that will have a broader perceive of computer from the foundation to all levels of learners. Computer through Education refers to computer knowledge and skills acquired through education or acquiring computer knowledge and skills through the learning of other subjects. This work is based on class use of computers or computer in Education as described above.

Diaga (2018) identified three applications associated with educational use of computer, namely; computer Aided Instruction (CAI), computer managed learning (CML) and Computer- Based Training (CBT). This work falls within the first category, that is, computer- Aided Instruction. Computer- Aided Instruction (CAI) is the general term used to describe virtually all learning activity that

is promoted by computer or in which a computer is involved (Beech, 2020).

CAI Modes:

Van- Braak and Valcke (2022) listed the various modes and functions of CAI as follows; CAI functions are;

(i) Management of learning, (ii) Testing, (iii) Tutoring, (iv) Exercising, (iv) Use of a computer for producing teaching materials, (iv) Dissemination of materials and (vii) medium of expression. CAI modes include, (i) problem solving, (ii) Drill and practice, (iii) Simulations and games (vi) Tutorial modes (v) Dialogue modes and (vi) Enquiring modes.

Depending upon the relative degree of involvement by the learner, two basic types of CAI were identified by Diaga (2018) as CAI which involves the use of computer as teaching/learning aid, but there is no direct involvement by the students. In contrast, interactive CAI promotes active learning in which there are high degree of student's participation and involvement. Here the students' behaviour and responses to instructional materials can be used to help determine the most appropriate pathway through the body of knowledge coded in the CAI.

Pixton (2021) prescribed that each of the two categories of CAI may be used at different levels, for instance, at the initial stage of introducing a new topic, passive CAI could be useful. On the other hand, interactive CAI could be useful in learning by discovery situation. Pixton described three applications of computer Aided instruction (CAI) under the following headings; computer-based learning, computer-based training and computer-supported collaborative learning. Computer based learning (CBL) refers to the use of computers as a key component of the educational environment while this can refer to the use of computers in a classroom, the term more broadly refers to a structured environment in which computers are used for teaching purposes. Pixton explained that computer-based trainings (CBTs) are self-paced learning activities accessible via a computer or handheld device. CBTs

typically present content in a linear fashion, much like reading an online book or manual. For this reason, they are often used to teach static processes, such as using software or completing mathematical equations.

The term Computer-Based Training is often used interchangeably with Web-based training (WBT) with the primary difference being the delivery method. Where CBTs are typically delivered via CD-ROM, WBTs are delivered via the Internet using a web browser. Assessing learning in a CBT usually comes in form of multiple choice questions, or other assessments that can be easily scored by a computer such as drag-and-drop, radio button, simulation or other interactive means. Assessments are easily scored and recorded via online software, providing immediate end-user feedback and completion status. Users are often able to print completion records in the form of certificates.

CBTs provide learning stimulus beyond traditional learning methodology from textbook, manual, or classroom-based instruction. For example, CBTs offer user-friendly solutions for satisfying continuing education requirements. Instead of limiting students to attending courses or reading printed manuals, students are able to acquire knowledge and skills through methods that are much more conducive to individual learning preferences, (Whyte, 2021). Whyte further reported that CBTs offer visual learning benefits through animation or video, not typically offered by any other means. CBTs can be a good alternative to printed learning materials since rich media, including videos or animations, can easily be embedded to enhance the learning. Another advantage to CBTs is that they can be easily distributed to a wide audience at a relatively low cost once the initial development is completed.

However, CBTs pose some learning challenges as well. Typically, the creation of effective CBTs requires enormous resources. The software for developing CBTs (such as Flash or Adobe Director) is often more complex than a subject matter expert or teacher is able to use. In addition, the lack of human interaction can limit both the type of content that can be presented as well as the type of assessment that can be performed. Many learning organizations are beginning to use smaller CBT/WBT activities as

part of a broader online learning program which may include online discussion or other interactive elements.

Isah (2023) described Computer-Supported Collaborative Learning (CSCL) as one of the most promising innovations to improve teaching and learning with the help of modern information and communication technology. Most recent developments in CSCL have been called E-learning 2.0, but the concept of collaborative or group learning whereby instructional methods are designed to encourage or require students to work together on learning tasks has existed much longer. It is widely agreed to distinguish collaborative learning from the traditional 'direct transfer' model in which the instructor is assumed to be the distributor of knowledge and skills, which is often given the neologism E-Learning 1.0, even though this direct transfer method most accurately reflects Computer-Based Learning systems (CBL). Blogs, wikis, and Google Docs are commonly used CSCL mediums within the teaching community. The ability to share information in an environment that is becoming easier for the lay person, has caused a major increase of use in the average classroom.

One of the main reasons for its usage states that it is "a breeding ground for creative and engaging educational endeavors". Using web 2.0 social tools in the classroom allows for students and teachers to work collaboratively, discuss ideas, and promote information. According to Kpakor (2023), blogs, wikis, and social networking skills are found to be significantly useful in the classroom. After initial instruction on using the tools, students also reported an increase in knowledge and comfort level for using web 2.0 tools. The collaborative tools additionally prepare students with technology skills necessary in today's workforce. Locus of Control remains an important consideration in successful engagement of E-learners. According to Whyte, (2021) the continuing attention to aspects of motivation and success in regard to E-learning should be kept in context and concert with other educational efforts.

Information about motivational tendencies can help educators, psychologists, and technologists develop insights to help students perform better academically. The virtual classroom also provides the opportunity for students to receive direct instruction

from a qualified teacher in an interactive environment. Students have direct and immediate access to their instructor for instant feedback and direction. Adamu (2020) added that the virtual classroom also provides a structured schedule of classes, which can be helpful for students who may find the freedom of asynchronous learning to be overwhelming. The virtual classroom also provides a social learning environment that closely replicates the traditional "brick and mortar" classroom, (Kekere, 2018). Most virtual classroom applications provide a recording feature. Each class is recorded and stored on a server, which allows for instant playback of any class over the course of the school year.

This can be extremely useful for students to review material and concepts for an upcoming examination. This also provides students with the opportunity to watch any class that they may have missed, so that they never have to fall behind. It also gives parents the ability to monitor any classroom to insure that they are satisfied with the education their child is receiving.

According to Sendal (2023) in Isah (2023), students proceed at their own pace. If they need to listen to a lecture a second time, or think about a question for a while, they may do so without fearing that they will hold back the rest of the class. Through online courses, students can earn their diplomas more quickly, or repeat failed courses without the embarrassment of being in a class with younger students. Students also have access to an incredible variety of enrichment courses in online learning, and can participate in college courses, internships, sports, or work and still graduate with their class. In many models, the writing community and the communication channels relate with the E-learning and the M-learning communities. Both the communities provide a general overview of the basic learning models and the activities required for the participants to join the leaning sessions across the virtual classroom or even across standard classrooms enabled by technology.

Many activities, essential for the learners in these environments, require frequent chat sessions in the form of virtual classrooms and/or blog meetings. Onah (2018) described two other modes of CAI as Learning Management System (LMS) and

Learning content management system (LCMS). A learning management system (LMS) is a software used for delivering, tracking and managing training/education. LMSs range from systems for managing training/education records to software for distributing courses over the Internet and offering features for online collaboration. A learning content management system (LCMs) is software for author content (courses, reusable content objects). An LCMs may be solely dedicated to producing and publishing content that is hosted on an LMS, or it can host the content itself. The Aviation Industry Computer-Based Training Committee (AICC) specification provides support for content that is hosted separately from the LMS. ALMs allows for teachers and administrators to track attendance, time on task, and students progress. LMS also allows for not only teachers and administrators to track these variables but parents and students as well. Parents can log on to the LMS to track grades. Students log on to the LMS to submit homework and to access the course syllabus and lessons.

Still on CAI modes, Pixton (2021) identified computer-aided assessment and Electronic performance support systems. Computer-aided Assessment (also but less commonly referred to as E-assessment), ranging from automated multiple-choice tests to more sophisticated systems is becoming increasingly common. With some systems, feedback can be geared towards a student's specific mistakes or the computer can navigate the students through a series of questions adapting to what the students appears to have learned or not learned.

The best examples follow a Formative Assessment structure and are called "Online Formative Assessment". This involves making an initial formative assessment by sifting out the incorrect answers. The author/teacher will then explain what the students should have done with each question. It will then give the students at least one practice at each slight variation of sifted out questions. This is the formative learning stage. The next stage is to make a Summative Assessment by a new set of questions only covering the topics previously taught. Some will take this even further and repeat the cycle such as BOFA which is aimed at the Eleven plus exam set in the UK.

The term learning design has sometimes come to refer to the type of activity enabled by software such as the open-source system LAMS which supports sequences of activities that can be both adaptive and collaborative. The IMS Learning Design specification is intended as a standard format for learning designs, and IMS LD Level A is supported in LAMS V2. e-learning has been replacing the traditional settings due to its cost effectiveness. Pixton further explained that Electronic performance support systems (EPSS) is a "computer-based system that improve worker productivity by providing on-the-job access to integrated information, advice, and learning experiences".

Whyte (2021) talked about E-learning as another CAI mode. E-learning (Electronic Learning) comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. The term will still most likely be utilized to reference out-of-classroom and in-classroom education experiences via technology, even as advances continue in regard to devices and curriculum. E-learning is the computer and network-enabled transfer of skills and knowledge. E-learning applications and processes include web-based learning, computer-based learning, virtual education opportunities and digital collaboration. Content is delivered via the Internet, instructor-led and includes media in the form of text, image, animation, streaming video and audio. Abbreviations like CBT (Computer-Based Training), IBT (Internet-Based Training) or WBT (Web-Based Training) have been used as synonyms to E-learning. Today one can still find these terms being used, along with variations of E-learning such as E-learning, e-learning, and e learning.

Hanks (2021) identified two important CAI modes namely; CAI with animations and CAI without animations. CAI with animations refers to CAIs in which the content is presented alongside a rapid display of a sequence of images to create an illusion of movement. CAI without animation refers to all CAIs in which the content of instruction is presented to the learners without any such display described above. This study is based on these two modes of CAI. Interest of the researcher is on finding out the effect

of Computer Aided Instruction on secondary school students' interest, academic achievement and retention in Computer studies.

Expository or Lecture Method

The word expository is an adjective qualifying either the noun expositor (a person that explains complicated ideas or theories) or the noun exposition (a comprehensive description and explanation of a theory). Similarly, Kpakor (2023) defines lecture as an educational talk or a long serious speech. From the foregoing, therefore, expository or lecture method of teaching refers to that teaching method in which the teacher gives a comprehensive description or explanation of an idea or a topic to a listening audience (class). In the words of Isah (2023), lecture method is one of the earliest teaching methods in use dating back to the period of the Ancient Greek philosophers and the Jewish Rabbis who were usually surrounded by their students who listened to their 'words of knowledge or wisdom'. The major characteristic of this method of teaching is that the teacher talks and gives out his knowledge while the students listen carefully. Hence, this teaching method is usually described as "teacher-centered" as students mainly assume a passive role.

Other descriptions given to expository or lecture method include; conventional method, that is, a method based on or in accordance with a way in which teaching is usually done. Some educationists also refer to it as the traditional method, thus, suggesting that it is a teaching method based on a long-established custom or belief passed on from one generation to another, (Diaga, 2018). Expository or lecture method as defined by Hanks (2021) is a process whereby the teacher verbally delivers pre-planned body of knowledge to his students. The teacher talks while the students listen and jot down points. Hanks further alleged that in some cases the teacher may not take questions from the students. Sometime, he entertains questions either to emphasize some points or to make some points clearer. No doubt, lecture method has \come under serious criticisms by modern Computer Studies educators, yet it is still the most widely use in secondary and tertiary institutions in Nigeria today. One cannot blame those who criticize lecture or

expository teaching method given the poor performance of students taught through the method, (Rasaki, 2023).

Adamu (2020) observed that lecture or expository method cannot just be written off and called all sorts of bad names as it can still be useful in some ways and circumstances. The circumstances in which lecture method will be most useful, according to Adamu, include;

(i) in teaching a crowd of students, large or over populated classes.
(ii) when introducing new topics
(iii) to clarify some points which the students may misunderstand when individual or group method of teaching is used
(iv) when no appropriate text books are available to aid students' study and
(v) in teaching unseen students via the radio or television (distance learning).

There seem to be some flaws in the above assertions. The first situation described, that is, crowded or over populated classes seems to sound more acceptable. This is because other points raised by Keko can be keenly contested. It may take strong efforts to convince some educationists that lecture method is the best method for introducing new topics, for clarifying some points or for situations where there are no text books for students to use. Also secondary education by distance learning is not common in Nigeria.

Still on advantage of the expository or lecture method, Akpan (2023) listed the following;

(i) very useful in covering a wide scheme or content within a short or limited period
(ii) fewer instructional materials are required
(iii) uniformity in the facts given to the students as they receive the same material content at the same time
(iv) teacher tells all facts, saving the students the efforts and strength to search for facts in textbooks

(v) teacher has full control of what the students should learn and know
(vi) most suitable for teaching a large population of students at once

Again, Akpan's fourth point may be counter-productive as the students may remain docile, dependent and unable to research and discover or verify truths themselves. Akpan did not only list advantages, he also outlined the following disadvantages of the lecture or expository teaching method;

(i) it makes the students passive as it is mainly teacher-centered.
(ii) it allows minimal interaction between teacher and students as well as students and students in the classroom.
(iii) does not encourage mind of inquiry and creativity in the students.
(iv) does not carter for individual needs or differences.
(v) students may not retain what is taught so long as they were inactive in the class.
(vi) students with hearing impairment may lag behind as mainly auditory sense is used in lecture classes.

Al-Gazir (2021) gave some tips on how to maximize the advantages of lecture or expository method. He advised that using expository or lecture method requires adequate and thorough preparation in which the teacher must consider the objectives to be achieved in the lesson. A good command of the language of instruction is very necessary for successful use of lecture method. Hanks further hinted that it is necessary for the teacher to prepare appropriate and related examples to be used during the lesson to "drive home" his points. Also illustrative materials like pictures and concrete objects that can make the points clearer to the students should equally be prepared before land.

Similarly, Julius (2019) noted that the teacher can utilize the benefits of the students' entry behaviour and make the introduction of his lesson very appealing and interesting. Also the teacher can make use of short stories, a statement, a question or any activity

which may stimulate interest and attention of the students. A good mastery of the set induction skills is very necessary. When this is achieved, Julius held that a fluent teacher should then present the lesson in a sequence and interrelated order for an easy flow of understanding. There may also be need to repeat some points when necessary for emphasis and clarity. Hassan (2023) suggested that in expository method, the teacher can use periodic humour and appropriate examples to enliven the students' interest and avoid boredom and the strain of following the lectures.

Hassan further suggested that the teacher should always conclude or close his lessons by summarizing and recapitulating the salient points in the lesson, to aid students' recall or retention of what is taught. References for further reading or other forms of assignment for reinforcement can be very useful. However, it is important to note that repetition as suggested above should be done with caution to avoid boring the students. Use of humour should not lead to over digressing from the actual points of the lesson. Also teachers should maximize the use of chalk boards as this will minimize the disadvantages of students with hearing impairment. Conclusively, having reviewed both sides (advantages and disadvantages) of the lecture or expository method, one cannot write off expository method of teaching, yet, the desired result have not been seen in products of this method.

Research evidences earlier cited in this work have consistently showed that expository method is the most commonly used teaching method in secondary schools where students' interest, academic achievement and retention in Computer Studies is yet to be satisfactory. Hence, the need for studies such as this work which aims at bridging this methodology gap.

Concept of Interest

Kpakor (2023) defined interest as inward state of the mind towards something. Baraje (2019) described interest as a disposition, attitude and feelings of an individual towards an activity which shows behaviorally, the extent the person liked to participate in an activity. Dave (2019) defined interest as follows; "the state of wanting to know about something or someone", "the quality of

making someone curious or attentive" and "subject about which one is concerned or enthusiastic". Similarly, Olayinka (2019) submitted that interest viewed from a generalized perspective is the feeling of one whose attention, concern or curiosity is particularly engaged by something. Alternatively, Olayinka saw interest as that which concerns, involves or draws the attention of or arouses the curiosity of a person. Also Kunlu (2019) defined interest as the feeling of intentness, concern or curiosity about an object.

More-so, Julius (2019) defined interest as the likes and dislikes of an individual. While Imuno (2019) defined interest as the quality which arouses concern or curiosity which holds a child's attention on an object. Interest therefore is the power of exciting such concern and involvement that draws the attention of a person. Interest in Computer Studies viewed from the afore-cited conceptual perspectives may be regarded as the mental and emotional disposition of individuals to engage in Computer Studies-related topics and activities. Hanks (2021) identified four interest types namely; manifested interest, tested interest, expressed interest and inventoried interest. According to him when an individual participates in an activity, his interest is manifested. For instance, a student listening and carrying out class activities along with the teacher has manifested his/her interest. When achievement is measured, the scores indicate the scorer is interest in the subject, hence, this illustrates tested interest.

Expressed interest is seen when an individual declares his interest verbally. Inventoried interest is used to rate an individual's interest where many items or groups of items are involved. In this study, the instrument that shall be used to collect data on the students' interest is the Computer Studies Interest Scale (CIS) which combines the attributes of these four interest types.

Additionally, Akpan (2023) hinted that interestingness is not a unitary concept, rather at least two different types of interest can be distinguished, namely; emotional interest and cognitive interest. Emotional interest is created by events that are arousing. Cognitive interest on the other hand is produced by the relationships between incoming information and background knowledge. Akpan explained further that interest can be generated by the intellectual activity of

resolving incongruity, such as that entailed in making inferences. These explanation suggests that static CAI are more likely to increase cognitive interest than animated CAI because the former require the learner to generate more inferences to fill the gaps between them. On the other hand, the later are more likely to increase emotional interest because animation may induce higher arousal levels. Hence, George (2020) warned about what he referred to as "seductive details" in the use of learning materials such as games. These seductive details may make a learning/teaching aid more attractive but they are generally irrelevant.

Buckie (2020) further validated this claim when he asserted that seductive details show a negative effect on learning. Natshi (2020) observed that adding entertaining graphics to a scientific or mathematical text increased emotional interest but not cognitive interest. Another important aspect of a learner's motivation and interest is controllability or interactivity. Pixton (2021) observed that one strategy for enhancing the learner's motivation is to increase his sense of control and self-determination by providing choice or locus of control. It has been well documented that individuals offered choice show more enjoyment, better performance, and greater persistence at a variety of activities due to increased interactivity or controllability, (Hanks, 2021). Controllability and interactivity may differ among different CAI types. It is expected that the controllability and interactivity attributes to influence the students' interest.

Concept of Achievement

Olayinka (2019) asserted that the word "achievement" is the noun form of the verb "achieve". Hence, achievement is the process of bringing about or accomplishing something through effort, skill or courage. In this work, achievement strictly refers to academic achievement and more specifically, academic achievement in senior secondary school Computer Studies. Academic achievement generally suggests an achievement relating to education and scholarship, (Onah, 2018). According to Hanks (2021), academic achievement depicts students' performance on a standard of measurement such as performance test, skill test, analytical thinking

test, etc. It is therefore, not out of place to describe academic achievement as the gain in knowledge of students as a result of taking part in a learning activity or programme. Learning here refers to changes in a person's behavioral repertoire rather than just a change in behaviour. Academic achievement is a result-oriented construct that encapsulates the extent of performance of a desired task. (Whyte, 2021).

Pixton (2021) argued that since academic achievement is a measure of students' success in an academic setting, it is therefore, the goal of parents, teachers and school administrators to foster achievement. Berceky (2020) stated that students' achievement in Computer Studies, just like every other school subjects is usually done using assignments, projects, tests and examinations. These achievement measurement tools are used to assess (evaluate) the worth of the students' learning and as well predict their future academic endeavors. In this study, students' achievement in Computer Studies shall be measured using the Computer Studies Achievement Test (CSAT). Derbuck (2023) affirmed the validity of the use of achievement tests especially in research studies designed to determine the effectiveness of two or more instructional strategies and or methods.

Similarly, Akpan (2023) advanced that the major advantage of use of achievement tests is that apart from estimating the relative effectiveness of an innovation, achievement tests also identify areas of weaknesses in innovative techniques, thereby paving way for remedial action(s). This study therefore, shall not only use the Computer Studies Achievement Test to infer on the efficacy of the methods under study, but shall as well use its results or findings to proffer veritable ways of maximizing the use of those teaching methods in circumstances where any of them becomes the most appropriate.

Hassan (2023) identified some factors that could determine students' achievement. They include teacher-qualification, teacher's knowledge of the subject matter and ability to deliver effectively, environment, students' state of mind, students' readiness, teaching method, availability, utilization and suitability of instructional aids and teacher motivation. In the same vein, Oluremi (2023) grouped

the factors under three broad sub-headings viz; teacher-related, students-related and environmental factors. Further-more, Isah (2023) classified the factors as follows; Knowledge-oriented, economic-oriented, psychological and environmental. The list is endless. However, this study shall restrict itself to only teaching method as a determinant of students' achievement. Hence, concerted efforts shall be made to ensure that any observation made in the students' achievement can genuinely be attributed to the treatment administered. In specific terms, this study intends to ascertain the effect of CAI on secondary school students' interest, academic achievement and retention in Computer studies.

Concept of Retention

Retention is the noun form of the verb "Retain". Olinya (2020) defined retain as "keep"; "continue to have or hold" or "keep in place". In the same vein, Agbo (2022) defined retain as "keep possession of", "absorb and hold" or "keep in place". It follows therefore, that retention, which is the act of retaining, maybe defined as the act of "absorbing and holding" or "to continue having or holding". In the context of this work, retention refers to the act of absorbing, holding, or continuing to hold or have facts or things learned. On problems of retention, Ezeliora (2022) asserted that failure to provide enough applications to real life activity and social usage cum poor teaching techniques are strong limiting factors to students' retention in Computer Studies. Similarly, isah (2023) contended that for improvement of retention of learned materials in Computer Studies, programmed learning is indispensable. Retention, thus, depends mainly on teaching strategy adopted by the teacher.

Hanks, (2021) investigated the effect of computer aided drill and practice on students' achievement and retention in Computer Studies. Data analysis in that quasi-experimental design revealed that students taught through static CAI achieved better and retained more of the learned Computer Studies than those taught with the traditional lecture method. Memory and learning are so closely related in meaning and functions that sometimes they are used interchangeably. For example, the definition of Learning as adopted

by most educators describes it as “a relatively permanent change in potential behaviour which is acquired through practice or experience. The word “relatively permanent” in the definition connotes something stored or locked up somewhere and this is exactly what the memory is all about. Also the word “potential behaviour’ implies something for a “later use” and this is the retrieval aspect of memory. Therefore, learning implies memory and memory implies learning, (Julius, 2019).

About memory, if there is any living organism that can use the past to live the present and shape the future that organism is human being. His capacity to store experience and retrieve it for use in daring situations places him above all other living creatures. According to Derbuck (2023) memory is the storage and retrieval of things learned earlier. It is simply the ability or the power to store facts in the conscious mind and recall them for use in a later situation.

Daniels further enumerated the following functions of memory;

1. It allows the storage of information, that is, preservation of past experience.
2. It allows the retrieval of stored information for use when needed.

The other functions derive directly from functions 1 and 2 above.

3. It allows human beings to organize their lives
4. It saves people from danger through recognition
5. It places human beings above other creatures
6. It enhances our innovativeness and creativity through convergent and divergent thinking.
7. It allows human beings to control their lives.

On how the memory operates, Atkinson and Shiffrin (1968), in Olinya (2020) state that experience get stored in stages. Precisely they mention a sequential – three – stage process, starting with Sensory Register Short Term Store and then the Long term store illustrated by (the figure) adapted from Morgan et al (1979) and shown below;

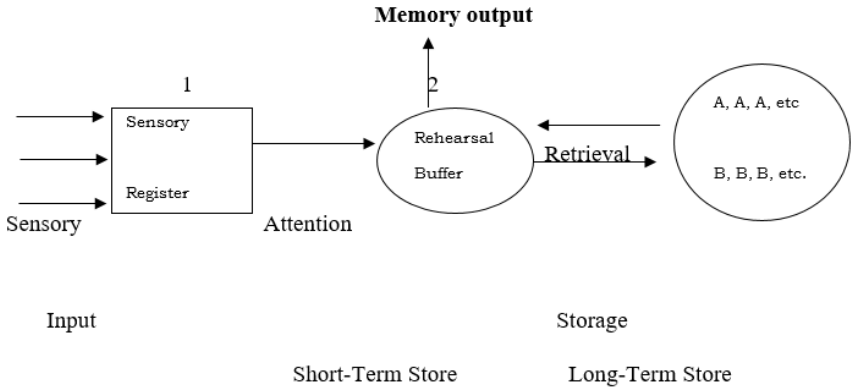


Figure 1: Morgan et al (1979) memory three – stage process model.

Stage 1: Sensory input is received. Here the sense organs of sight (eye), hearing (Ear), touch (Skin), smelling (nostril) and tasting (tongue) are active in the sense that they receive stimulation from the environment and briefly store it for about one to few seconds. In a nutshell, the sense organs are the Sensory Registers for sensory inputs from the environment. The sensory register receives, processes and sends to the second stage. The processing done by the sensory register is simple giving attention to the input. Any input not giving attention is ignored, discarded, or forgotten. It is only those held briefly for one to few seconds (attended to) that are pushed to the next stage.

Stage 2: The second stage is the short term store or short term memory. As soon as the input is received from sensory register (stage 1) the short term store processes it by rehearsing it. This is why this second stage is referred to as rehearsal buffer. It is holding stage where input is held for about 30 seconds. To rehearse is to repeat over and over. After rehearsal, the information in input is pushed to the third stage

which is the long term store. For information to pass to the third stage, it has to be processed, that is, rehearsed, if not, such information is lost or forgotten.

Stage 3: This stage belongs to the Long-term store. It receives well-rehearsed information form the short-term store. Its function includes receiving and organizing information into categories. This categorization could be done alphabetically or chronologically. Such as all A^s together, all B^s together, all C^s together or in the order of 1,2,3,4,5 etc. The Long term memory can hold information for days, for weeks, for months, for years or for life time.

In the words of Buba (2020), it is a fact that our memory (LTM) has a tremendous capacity for encoding information. But then, how do we know that something at all is in our memory. This is done by measuring retention. We measure retention through:

Recognition, Recall and Relearning

- In recognition, a correct answer within other answers is presented to a subject (a person) who is expected to recognize and select the correct answer among the available.
- In recall, subjects or respondents are not presented with any answers at all, whether right or wrong. They are expected to supply the answers.
- While in relearning, if a subject is to relearn already learned materials, he is expected to relearn this same material using lesser time than when he first learned it.

The time saved (saving time) is result of practice effect. It is measured thus:

$$\text{Saving Time} = \frac{\text{Original Learning Time} - \text{Relearning Time}}{\text{Original Learning Time}} \times 100$$

The retention here is the time saved in relearning. Hassan (2023) added a fourth one as reproduction. He explained reproduction as a measure of learning that involves remembering accurately in order to recall verbatim.

Buba further explained that retrieval fit is possible because it is aided by retrieval cues. The cues play the role of reminders. For example, chair could be a retrieval cue for table, soldier a retrieval cue for war, husband for wife and rice for stew. Nuhu (2019) submitted that the retrieval cue or reminder to be effective, it should be coded with the learned material at the point of learning. This approach he described as "encoding specificity principle." It should be noted that people tend to provide their own retrieval cues even when non is readily available.

Another submission by Baraje (2019) say retrieval is possible through "tagging" and "cueing." This theory, - generation, recognition or tagging theory – says a tag is giving to an item to be remembered at the time it is being encoded for storage in LTM. The retrieval process starts with a cue. This cue makes us to generate a search for the tagged item through the portion of memory to which we have been directed by the cue. Undoubtedly, what is not retained if forgotten. It follows therefore, that we cannot not explain retention fully without the mention of forgetting.

Curve of Forgetting

Wale (2020) concluded that the general pattern of loss of retention is that greatest loss do occur immediately after acquisition, with the rate of loss diminishing after that. This has come to be known as curve of forgetting.

The figure below amply illustrates this.

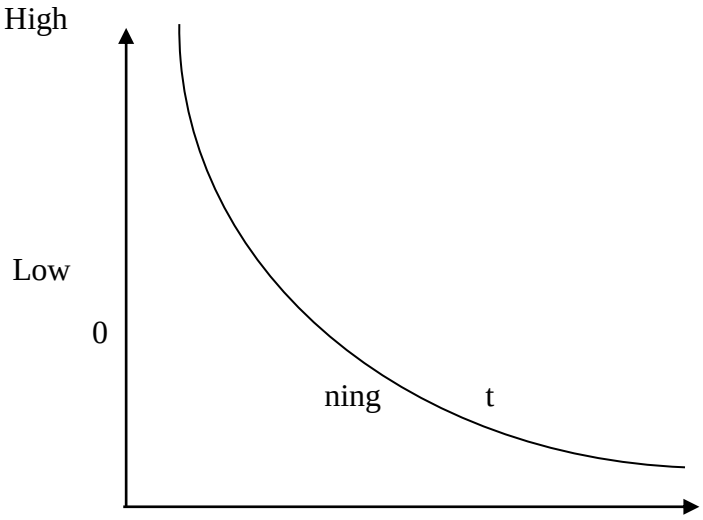


Figure 2: Herman Ebbinghaus Curve of Forgetting model.

On Problems in Retention, Wale (2023) wrote two major problems exist concerning our effort to retrieve learned materials from long term memory. They are:

Tip-of-the-tongue phenomenon and Confabulation

These two problems make retrieval difficult.

In Tip-of-the-Tongue Phenomenon sometimes we try to remember something e.g. a name. We have such names at the tip of the tongue but not in the memory. The name keeps going back. We may sometimes remember the starting alphabets Fa…….. something or sometimes the sound of the name. This is what Bliss described as the tip-of-the-tongue phenomenon.

Bliss explained that confabulation**:** Is due to over-excitement of high motivation to remember something. In the process we excitedly manufacture a report that seems appropriate and we tend to believe it to be true, whereas it is false or wrong. Confabulation is therefore facts mixed with fictions which is believed to be true. Everyone confabulates to some extent. We have the ability to close gaps in perceptual situations.

Therefore, we simply get few key features and fill in the rest. The major interest of this study is to proffer solutions to problems of retention, that is, finding out ways of improving retention or memory. Hence, the study intends to verify the effect of the teaching methods under study on students' retention of the learned material.

Concept of School Ownership

The term "ownership", according to Hassan (2023), is the act, state or right of possessing. In this study, school ownership is categorized into two, namely, public and private schools. Public school here refer to all schools owned, funded and overseen by either the local, state, or federal government. Private schools refer to all schools owned, funded and overseen by a private proprietor which may be either an individual, group of persons, religious organizations or any other non-governmental organizations. It is important to clarify that some secondary schools run by some government departments or parastatals either as staff's school or as a business enterprise are not directly funded and overseen by the government, hence, such schools are also classified as private.

Kpakor (2023) submitted that over the years, school ownership in Nigeria has generated lots of concern to educators and various tiers of government. Kpakor further held that education generally was a religious bodies' or missions' affair in Nigeria, until the government took over schools with reasons that the missions were running the schools below standard. In the same vein, Isah (2023) narrated that when the government took over schools in the pre-independence era, Nigeria had practically only one type of education generally represented by the relatively few schools conducting a six-year course similar to those in the United Kingdom and leading to the Cambridge school certificate.

Nuhu (2023) reported another development when secondary school education was divided into three, viz; a government sector, an assisted sector and a non-assisted sector. The government sector constituted an important part of the whole system and after independence was considerably enlarged. It included a number of schools and those schools which were established as experiments. The assisted sector comprised part of the local government and

private sectors receiving assistance through the grant-in-aid system. The remaining schools constituted the non-assisted sector the assisted sector included grammar schools, which were in the majority, some commercial schools in the West and Lagos, and the girls' modern schools in the East and Logos. The non-assisted sector included all modern schools in the west, a good number of schools and almost all commercial schools.

The National Policy on Education (2004) also states that government welcomes the participation of voluntary agencies, communities and private individuals in the establishment and management of secondary school education. Hence, the practice today is that private individuals, private associations or tier non-governmental agencies can operate schools according to their own principles, as long as they comply with certain government requirements. For public or government schools, the present practice all over the federation is that the state governments own (fund and oversee) the schools in their territories apart from the federal government colleges funded and overseen by the federal government. Al-Gazir (2021) lamented that the financial burden of owning the secondary school education schools is weighing down so many state governments, especially the non-oil producing states. Consequently, so many state governments tend to shy away from this major social responsibility of the state to her citizens. Thus even some state governments' decision to return some schools back to their original mission owners has been widely criticized as government strategy to shy away from their legitimate social responsibility (Natshi, 2020).

According to Akpan (2023), as the cry of falling standard in Nigerian educational systems increase, parents and guardians seem to believe that private schools is the solution, not minding that the major allegation that led to government takeover of schools from missions was that they operated the schools below standard. Evidently, the rate at which private schools spring up in almost every street, today tend to suggest that the business in incrative. Almost all uncompleted buildings and church premises are converted to private schools, mindless of the high cost when compared to public schools.

Nduka (2018) reported that many private schools use unqualified teachers to run their schools. Specifically, some of the private schools use quack teachers to teach in primary schools. Agbo (2022) alleged that many private schools' environment are not conducive for teaching and learning. Whyte (2021) reported that things may not be different in public schools where facilities are vandalized, dilapidated and neglected. Also teachers play truancy and instructional materials are either non-existence or obsolete. From the fore-going, it becomes obvious that more investigations such as this work is very timely to look into the factor of school ownership with regards to students' achievement, interest and retention in are subjects such as Computer Studies.

CHAPTER 8

Topic:

DEPRESSION AND STIGMATIZATION AS PREDICTORS OF MARITAL CONFLICT AMONG PARENTS WITH AUTISTIC CHILDREN IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Depression

Depression generally is attributed to a mental state of low mood and aversion to activity. Harry (2017) held that depression affects a person's thought, behavior, feelings, and sense of wellbeing. According to Harry, depressed people often experience loss of motivation or interest in, or reduced pleasure or joy from, experiences that would normally bring them pleasure or joy. Obome (2018) associated depression with unhappiness, despair, sadness and downheartedness. Similarly, Preesha (2019) described depression with terms such as misery, hopelessness, dejection and melancholy. According to Preesha, depressed mood is a symptom of some mood disorders such as major depressive disorder and dysthymia. Depression may present in various forms. For instance, depression may present as a symptom of some physical diseases and a side effect of some drugs and medical treatments. Depression may also take the form of sadness, difficulty in thinking and concentration and a significant increase or decrease in appetite and time spent sleeping. Most important to this study, depression may occur as normal temporary reaction to life events, such as the loss of a loved one or a feeling of guilt or a feeling of being accused of wrong doing.

In traditional Nigerian society, parents of autistic children may be accused of causing or knowing about the cause of their

children's condition (Autism). Hence, Ademola (2017) averred that most parents of autistic children in Nigeria suffer depression as a result of name calling, suspicion and accusation from the society, the community, their neighbors, friends and even their close relations. Ademola further accused couples of suspicion and lack of trust among themselves. Ademola cited instances where husbands accuse their wives and other instances where wives accuse their husbands of witch craft and other wrong doings that resulted to their having an autistic child. All these could lead to feelings of depression, that is, feelings of dejection or hopelessness and may in extreme cases, lead to suicidal thoughts. Depression according to Smith (2020) can either be short term or long term.

Some parents may be depressed due to their childhood experiences. McDonald (2020) posited that adversity in childhood, such as bereavement, neglect, mental abuse, physical abuse, sexual abuse, or unequal parental treatment of siblings can contribute to depression in adulthood. Depression may also result from treatment and awful experiences from work place or other groups. According to Jackson (2020), depression also tends to run in families. Hence, the concept of Personality Depression which is associated with low extraversion, and people who have high levels of neuroticism are more likely to experience depressive symptoms and are most likely to receive a diagnosis of a depressive disorder. But interest of the researcher in this study was on depression of parents in relation with their autistic children. That is, the depression a parent suffers because he/she has an autistic child.

Further to this, the researcher was interested in finding out whether or not such depression could predict marital conflict among parents. This becomes imperative because studies known to the researcher have yielded no definitive conclusion on the predictive relationship existing between depression and various forms of marital conflict among parents of autistic children. Researchers such as Smith (2020), McDonald (2020) and Preesha (2019), in their separate studies reported that depression significantly predicted marital conflict among parents of autistic children. On the other hand, Ademola (2017) and Harry (2017) in their separate studies found the contrary. That is weak predictive relationship between

depression and marital conflict among parents of autistic children. To bridge this gap, there was need for another in-depth study such as this present one.

Concept of Stigmatization

Stigma is considered a social process, which is used by some groups and individuals to reinforce existing social inequalities. These inequalities may include gender, sexual orientation, race, class, ethnicity and possession of wealth. Jinadu (2017) defined stigmatization as the process of intentionally marking an individual or persons to indicate unacceptable behavioral moral traits as compared to prevailing standards. According to Jinadu, the mark here may be physical marks on the body or deliberate derogatory behaviors towards a person(s) all with the intent of discriminating against such person(s) socially or otherwise. In the same vein, Adung (2018) defined stigmatization as the process whereby a mark or attribute culturally understood as devalued and discrediting is recognized in, or applied to, an individual or group of individuals by another more powerful group of individuals. This stigmatizing mark works to differentiate and separate marked individuals from unmarked individuals because of the associated judgment that persons so marked are tainted and lesser.

No doubt, stigmatization is, to say the least, dehumanizing. This is because stigmatization is rooted in normative judgments. Hence, it reduces the stigmatized individual from a complex whole and "usual" person to this single tainted and discounted trait, (Marua, 2018). According to Marua, stigmatization is effected through interaction and it involves a combination of negative stereotyped beliefs, prejudiced attitudes and discriminatory behaviour toward marked individuals. Stigmatization takes place at both the interpersonal and broader systemic levels. Some stigma may be obvious, while others are known as concealable stigmas that must be revealed through disclosure. Stigma can also be against oneself, stemming from negatively viewed personal attributes in a way that can result in a "spoiled identity" (i.e., self-stigma). Stigma may also be described as a label that associates a person to a set of unwanted characteristics that form a stereotype. Perhaps, the worst

aspect of stigmatization is social stigma. Social stigma according to Baro (2018) is the disapproval of, or discrimination against an individual or group based on perceived characteristics that serve to distinguish them from other members of a society.

Stigma may affect the behavior of those who are stigmatized. Those who are stereotyped often start to act in ways that those who stigmatize them expect of them. Stigmatization does not only changes the behavior of the stigmatized, but it also shapes their emotions and beliefs. Members of stigmatized social groups often face prejudice that causes depression. These stigmas put a person's social identity in threatening situations, such as low self-esteem, (Kelly, 2020). Kelly further submitted that members of stigmatized groups start to become aware that they are not being treated the same way and know they are likely being discriminated against. Stigmatization is commonly related to culture, gender, race, socioeconomic class, age, sexual orientation, body image, physical disability, intelligence, and wealth and health conditions. Nwakwo (2019) hinted that in most African cultures, health conditions especially psychological disorders could be misunderstood by the natives. This misunderstanding results in the natives attributing some health conditions of psychological disorders to witchcraft, sin or other fetish beliefs.

Consequently, the victims and/or their parents become prime suspects. These suspicion according to Nwakwo may lead to erroneous conclusion that they (the victims and/or their parents) caused the sicknesses or disorders. Ogbonna (2017) noted that autism is one of the psychological disorders that attract ill feelings and stigmatization towards the victims and/or their parents in traditional Nigerian society. In this study, the researcher is interested in finding out the predictive relationship between stigmatization and marital conflict among parents of autistic children. That is, stigmatization of a parent suffers because he/she has an autistic child. Simply put, the researcher is interested in finding out whether or not such stigmatization could predict marital conflict among parents. This becomes imperative because studies known to the researcher have yielded conflicting findings on the predictive

relationship existing between stigmatization and various forms of marital conflict among parents of autistic children.

Researchers such as Sciz (2017), Mbang (2019) and Davidson (2020), in their separate studies found that stigmatization significantly predicted marital conflict among parents of autistic children. On the other hand, Ogbonna (2017) and Marshal (2020) in their separate studies reported the contrary. That is, weak predictive relationship between stigmatization and marital conflict among parents of autistic children. This gap justifies the need for more studies such as this present one.

Concept of Autism

Autism is a spectrum disorder. Hence, it can manifest very differently in each person. Formally, autism is called Autism Spectrum Disorder (ASD) or Autism Spectrum Condition (ASC). Nathir (2019) define autism as a neurodevelopmental disorder characterized by deficits in social communication and social interaction, and repetitive or restricted patterns of behaviors, interests, or activities, which can include hyper- and hyporeactivity to sensory input. Autism is a developmental disorder caused by differences in the brain. People with Autism Spectrum Disorder (ASD) often have problems with social communication and interaction, and restricted or repetitive behaviors or interest. People with ASD may also have different ways of learning, moving, or paying attention, (Mbang, 2019). The abilities of people with ASD can vary significantly. Autistic people may not look differently so as to set them apart from other people. They may look normal but autism will manifest in their behaviour. According to Obome (2018), autistic people may lack mutual sharing of interests; many autistic children prefer not to play or interact with others.

They may lack awareness or understanding of other people's thoughts or feelings: a child may get too close to peers (entering their personal space) without noticing that this makes them uncomfortable. They may also engage in a typical behaviors to gain attention: a child may push a peer to gain attention before starting a conversation. Marshal (2020) averred that autistic people experience deficits in their ability to develop, maintain, and understand

relationships, as well as difficulties adjusting behavior to fit social contexts. Autism Spectrum Disorder (ASD) presents with impairments in pragmatic communication skills, such as difficulty initiating a conversation or failure to consider a listener's interests to sustain a conversation. The ability to be focused exclusively on one topic in communication is known as monotropism, and can be compared to "tunnel vision". Marshal (2020) observed that it is common for autistic people to communicate strong interest in a specific topic, speaking in lesson-like monologues about their passion instead of enabling reciprocal communication.

Autistic people display a typical nonverbal behaviors or have difficulties with nonverbal communication. Consequently, Alaje (2017) held that autistic people may make infrequent eye contact or may avoid eye contact with an observer. Other display of autism is that autistic people may struggle with both production and understanding of facial expressions. They often do not know how to recognize emotions from others' facial expressions, or may not respond with appropriate facial expressions, (Yandev, 2020). Yandev added that autistic people may have trouble recognizing subtle expressions of emotion and identifying what various emotions mean for the conversation. Taswir (2019) stated that autism may result from environmental or genetic factors that predispose an individual to develop autism. According to Jackson (2020), there are many known environmental, genetic, and biological causes of autism. Jackson held that although genetic factors are predominate in the appearance of autism; however, the heritability of autism is complex, and many of the genetic interactions involved are unknown.

In rare cases, autism has been associated with agents that cause birth defects. Kelly (2020) posited that different underlying brain dysfunctions have been hypothesized to result in the common symptoms of autism, just as completely different brain types result in intellectual disability. Autism can be managed through a wide variety of therapies that help people with autism, or their families. Hilton (2020) added that such methods of therapy seek to aid autistic people in dealing with difficulties and increase their functional independence. Hilton however noted that therapy which can

eliminate autism within someone, does not exist yet. Treatment is typically catered to the person's needs. Adoga (2020) categorized autism treatment into educational interventions and medical management. Training and support are also given to families of those diagnosed with autism spectrum disorders (ASDs). Adoga hinted that sustained special education programs and behavior therapy early in life can help children with ASD acquire self-care, social, and job skills.

Through these programs, autistic people can be improved in functioning. Hence, leading to a decrease in severity of the signs and observed behaviors thought as maladaptive among them (autistic people). Autism can also be managed through applied behavior analysis (ABA), developmental models, structured teaching, speech and language therapy, social skills therapy, and occupational therapy, (Sciz, 2017). Sciz further hinted that occupational therapists may work with autistic children by creating interventions that promote social interaction like sharing and cooperation. From the foregoings, autism is not a death sentence. Autistic children, through adequate therapy and intervention may be recovered and empowered to become useful to themselves and their society. Hence, there is no need ascribing autism to witchcraft, sin or abominable act as is prevalent in traditional Nigerian society. If members of the society understand what autism is all about, there would be no need to stigmatize autistic children or their parents and cause then unnecessary depression.

Research evidences [Adikpe (2017), Abubakar (2018), Yandev (2020) and Davidson (2020)] have separately found strong positive correlation among depression, stigmatization and marital conflict with respect to parents of autistic children. On the otherhand, other researchers such as Ogbonna (2017), Ademola (2017), Harry (2017) and Marshal (2020) reported no significant predictive correlation among depression, stigmatization and marital conflict with respect to parents with autistic children. The task before this present study is to bridge these gap of no definitive conclusion.

Concept of Conflict

Conflict refers to a serious disagreement, argument or a struggle between two or more people. Conflict may occur when people have incompatible or irreconcilable views on issues. In other words, disparity in opinion, interest and stake may result in conflict. Akpoviano (2018) defined conflict as a struggle or quarrel usually between individuals or groups on the process of competing for something. Conflict may emerge from the allocation of scarce resources and from various decision making processes. According to Awofes (2021), Conflict is a part of organization life and may occur within the individual, between individual and between the individual and a group. While conflict is generally perceived as being dysfunctional, Awofes posited that conflict can also be beneficial because it may cause an issue to be presented and viewed from different perspective. As a matter of fact, many misunderstandings may deteriorate if not opened up. Thus, conflict presents opportunities for people to voice out, vent and express their feelings without trying to bottle them up in pretense.

Generally, conflict refers to diverse opinions, actions and attitudes emanating from different persons with intent to change, modify or prevent actions. Okoro (2018) viewed conflict as clash of interests, values, actions, views or directions. It is a kind of tension within a system, group, organization or association. Smith (2020) defined conflict as any divergence of interests, objectives or priorities between individuals, groups, organizations, or non-conformity to requirements of a task; activity or process. Conflict may result from unhealthy competition. In this case, it is very harmful. It is important to state that conflict is different from competition, although competition may result in conflict. The fact is that conflict may occur without any specific reference to competition, as it could occur because of breakdown in the mechanism of decision-making. Conflict is both a natural and a common phenomenon. Hence, it can occur anywhere and everywhere including groups, social and religious organizations, political associations, corporate entities, families, homes and in marriages. Interest of the research in this study is in marital conflict because in the contemporary society, cases of disagreement,

difference or arguments among married people abound. Hence, marital conflict is almost a household phenomenon in todays' world.

❖ **Marital conflict**

Marital conflict can be said to be the conflict that arises between two parties in marriage which can indicate child minding differences, temperamental differences, religious conflict of interest and even sexual disagreement. According to Akpoviano (2018), marital conflict arises when the inevitable tensions in marital relations cannot be contained, where these escalates it can lead to arguments, verbal abuse, physical abuse and other domestic violence. Problems between the parents can lead to the development of a dysfunctional family where the children take sides, act out there of parent's tension and use their behavior as a model for their own relationships. Okoro (2018) submitted that marital conflict is serious disagreement and argument about something important to the marriage. However, Okoro further noted that marital conflict may result from issues that are not very important to the family but misunderstood by one or both couples. Nuhu (2016) posited that marital conflict may result from incompatible or opposing needs and wishes of the individuals (couples) involved in the marriage. Such clash may arise out of a difference in thought process, attitudes, understanding, interest, requirements and even sometimes perceptions.

When married couples view things differently, disagree and opine in different ways, marital conflict may likely arises. No two individuals can think alike and there is definitely a difference in their thought process as well as their understandings. Disagreements among individuals lead to conflict and can as well pave way to marital conflict. Harry (2017) held that marital conflict is not just a difference of opinion rather, it is a series of events that have been poorly handled so as to deeply damage their marriage relationship. In marriage, conflict occurs when the needs and desires of spouses diverge and are thus incompatible. It is inevitable that conflict will occur to at least some degree in every marriage. It is not the existence of conflict in marriage that is detrimental in marital satisfaction, but how spouses manage conflict when it occurs. Smith

(2020) stated that marital conflict is a situation of having the lowest level of family harmony. Marital conflict may arise when couples in a relationship pursues his or her goals and in doing so, the party interferes with the other person's goal.

Harry (2017) after a thorough literature review, identified five indices of greater percentage of cases of marital conflict in developing nations. According to Harry, these indices include; parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict and marital sex related conflict. These indices were adopted for this study since it was conducted in Nigeria developing nation. The indices are discussed below

Parenting Role Conflict

Parenting is the process of promoting and supporting the physical, emotional, social and intellectual development of a child from infancy to adulthood. Parenting involves all aspects of raising a child including the biological relationships. Parenting roles are broad patterns of childrearing functions, practices, values and behaviours, (Harry, 2017). Parenting roles encompass the overall physical, emotional and spiritual climate facilitated by parents in and outside the home. Even when the child is physically far away from the parents, some sort of parenting roles are not hindered. Like every other human endeavour, conflict or clashes are inevitable in carrying out parenting roles. Hence, parenting role conflict may occur when there are incompatible demands placed upon a parent relating to his or her function or position. Parents experience role conflict when they find themselves pulled in various directions as they try to respond to the many statuses they hold, (Jinadu, 2017). Jinadu further hinted that parenting role conflict can be something that can be for either a short period of time, or a long period of time, and it can also be connected to situational experiences. According to Obome (2018) parenting role conflict begins because of the human desire to dominate, prevail and impose one's wishes on others. Obome explained that the parenting role conflict may result from clash of interest between couples with regard to choice of parenting style, and sometimes, even trivial issues such as choice of baby food, baby wear, children's school, etc could result in conflict.

Individual couples personality characteristic may also bring about parenting role conflict especially when aspects of a persons' personality are in conflict with those of his or her partner. Parenting role conflict according to Mbang (2019) may have many different effects on the behaviour of a parent as well as their family-life. Harry (2017) enumerated some indices of parenting role conflict to include differences in parenting styles, parenting responsibilities and parenting mentorship. Other areas parents may clash in their role or function were listed by Ademola (2017) as misunderstanding on child discipline, child's study habits, child's social behavioral pattern, child's dress codes, child's eating habit and child care. These nine indices were adopted for this study. They form the items of the cluster of questionnaire on marital conflict that addressed parenting role conflict.

Empirical works on relationship existing among depression, stigmatization and parenting role conflict among parent of autistic children have yielded conflicting findings. For instance, Smith (2020) and Obome (2018) found strong positive correlation between depression and parenting role conflict among parents of autistic children while Ademola (2017) and Harry (2017) found a weak correlation between depressions and parenting role conflict among parents of autistic children. Hence, there is need for another study such as this present one to bridge this gap of conflicting findings. On relationship between stigmatization and parenting role conflict among parents of autistic children, Mbang (2019) and Jinadu (2017) found a strong positive correlation between stigmatization and parenting role conflict among parents of autistic children. Thus, there is need for another study such as this present one to investigate more into this so as to reaffirm this finding or make a different finding.

Marital Verbal Conflict

Verbal conflict is a type of psychological/mental abuse that involves the use of oral, gestured, and language directed to a victim. Marital verbal conflict, according to Ngugah (2017) can include the act of harassing, labeling, insulting, scolding, rebuking, or excessive yelling towards a marriage partner. It can also include the use of

derogatory terms, the delivery of statements intended to frighten, humiliate, denigrate, or belittle a marriage partner. Ngugah stated that marital verbal conflict may also be described as marital verbal aggression, marital verbal attack, marital verbal violence, marital verbal assault, psychic aggression, or psychic violence. Marua (2018) warned that marital verbal conflict can result in mental and/or emotional distress for the victim. According to Marua, marital verbal conflict affects all populations, cultures, and individuals. These actions are psychologically damaging and are considered forms of emotional and physical harm to the victim. This type of behavior leaves individuals feeling poorly about themselves and can lead to the developing numerous negative health issues and disorders such as suicidal thoughts, depression, poor physical health, anxiety, obsessive-compulsive behaviors, personality disorders, and even aggression.

Victims of marital verbal conflict may display abusive behaviors towards the other couple and even other individuals in and outside the family, (Marshal, 2020). Marshal averred that constant marital verbal conflict may lead to development of constant feelings of mistrust, shame, doubt, guilt, and inferiority. Alaje (2017) enumerated various ways a person can use verbal communication to cause conflict in a marriage. They include: rejection of a husband's/wife's worth, isolating a husband/wife from social experiences, terrorizing a husband/wife with verbal assaults, ignoring talking about husband's/wife's needs, corrupting a husband's/wife's views of the world and over-pressuring a husband/wife in reason critically. Adung (2018) listed indices of marital verbal conflict as insult, scolding, casting of aspersion, blasphemy, mocking and talking rudely to a partner. Others include: slandering, irritating, flouting, cursing, scorning and libeling a marriage partner. McDonald (2020) added ridiculing, acting scurrilously, slamming you, laughing at and verbally abusing one's marriage partner. These Indies of marital verbal conflict were used to ascertain the existence of marital verbal conflict among the couples drawn for this study as captured in the instrument for data collection.

Research evidence on relationship between depression and marital verbal conflict among parents of autistic children available to this researcher have shown a one-sided finding. McDonald (2020), Aleje (2017) and Ngugah (2017) found a strong positive correlation between depression and marital verbal conflict among parents of autistic children. Consequently, there was need for another study such as this present one to carry out more investigation into this, perhaps, to authenticate this finding or make a different finding. On the other hand, Marua (2018) and Adung (2018) found strong positive correlation between stigmatization and marital verbal conflict among parents of autistic children while Marshal (2020) found a weak correlation between stigmatization and marital verbal conflict among parents of autistic children. Thus, suggesting a no definitive conclusion status and necessitating further study such as this present one to bridge the gap.

Marital Physical Conflict

Marriage most times, brings together people from different backgrounds, cultures, ethnicity and even races. Consequently, married couples may have incompatible or irreconcilable views on issues. When these incompatible or irreconcilable views on issues are mismanaged, serious disagreement, argument or a struggle may result. When such serious marital disagreement, argument or struggle are expressed physically, martial physical conflict occurs, (Baro, 2018). Preesha (2019) observed that marital physical conflict may take the form of direct physical combat, usually with exchange of blows or it may take the form of a more subtle conflict between the desires of the couples in a romance. Such desires may lead to rape or sexual violence both of which constitute marital physical conflict. Preesha hinted that all physical struggles, quarrels in marriage constitute an aspect of marital physical conflict. Preesha argued that people who assume that women or wives are always victims of marital physical conflict are wrong because some wives are physically stronger than their husband and there are instances where husbands are bullied by their wives.

Marital physical conflict encompasses all harmful, brutalizing, degrading and dehumanizing physical exchanges

between married couples. Abdullahi (2017) noted that marital physical conflict could exist outside the husband and wife. In such cases, Abdullahi explained that in-laws and parents of the couples may be involved. According to Abdullahi, when a boy or a girl fights his/her in-law on behalf of his/her brother or sister it constitute marital physical conflict. According to Preesha (2019), practices that constitute marital physical conflict include: fighting one's couple, beating one's couple, slapping one's couple, hitting one's couple, striking one's couple, bashing one's couple, rape and sexual violence. Davidson (2020) added blasting one's couple, attempting to zap one's couple, fighting one's children/in-laws, beating one's children/in-laws, slapping one's children/in-laws and hitting one's children/in-laws. Moreso, Yandev (2020) outlined other practices that could be interpreted as marital physical conflict as striking one's children/in-laws, bashing one's children/in-laws, blasting one's children/in-laws and attempting to zap one's children/in-laws. These indices constitute items used in this study to establish existence of marital physical conflict among subjects of the study.

Empirical studies on relationship existing among depression, stigmatization and marital physical conflict have shown a one-sided finding. Yandev (2020), Preesha (2019) and Okoro (2018) found a strong positive correlation between depression and marital physical conflict among parents of autistic children. Similarly, Davidson (2020), Baro (2018) and Abdullahi (2017) found a strong positive correlation between stigmatization and marital physical conflict among parents of autistic children. All this findings are tilted to one side (strong positive correlation). As a result, there is need for another in-depth study such as this present one to ascertain the validity of the findings enumerated above.

Marital Economic Conflict

The term economy refers to the state of an organization, group, entity or an individual in terms of the production and consumption of goods and services and the supply of money. It is also the careful management of available financial human material and other resources. Economy has been found to be an dispensable component of life. No individual or organization can function

effectively without viable economy. It is on this strength that adequate funding of the family has become imperative. The economy of a family is so important because it does not only affect members of the family but it could affect an entire community, state or even a whole nation, (Kadiri, 2017). Kadiri further hinted that development of a nation is equally effected by economy of individual units that make up the nation. These individual units have families at the foundational or nucleus level. The degree of finance availability dictates the extent and quality of development of a nation. Kadiri defined marital economic conflict as a misunderstanding, disagreement or quarrel resulting from mismanagement of the economy a marriage or a family. In the same vein, Ogbonna (2017) described marital economic conflict as a conflict triggered by misuse, misappropriation or mismanagement of the family resources. These resources according to Ogbonna include: financial resources, material resources, human resources and other resources needed for improved livelihood.

Families are product of marriages. It can therefore be said that every society depends on families and indeed marriages to survive. On this premise, marital economic stability becomes an indispensable component of successful societies. Contrarily, marital economic instability resulting from marital economic conflict could pose a dangerous threat to the existence and survival of any society.

According to Taswir (2019) marriages are investments that thrive in robust economic conditions. The economy of a nation may cost marital economic conflict in families within such nation. Hence, Taswir opined that marital economic conflict may not always result from misuse or mismanagement of the economic resources of the family, rather, marital economic conflict may result from harsh economic conditions and policies of a nation. Taswir explained that when a husband or a wife is rendered unemployed or when government economic policies affect a man's or woman's business adversely, marital economic conflict may arise. Whichever way marital economic conflict arises, the pain is borne by family members. Researchers such as Nathir (2019) and Kelly (2020) have listed some indicators of marital economic conflict. According to Nathir (2019) these indicators include: failure to provide food and

shelter for the family and inability to finance child training. Kelly (2020) added inability to meet family health needs, non-payment of utility bills, incapable of rendering financial assistance to in-laws and extended family members. These indicators were used in the questionnaire in this study to find out existence of marital economic conflict among the sample for the study.

Research evidence on relationship between depression and marital economic conflict among parents of autistic children available to this researcher have shown a one-sided finding. Jackson (2020), and Taswir (2019) found a strong positive correlation between depression and marital economic conflict among parents of autistic children. So, there is need for another study such as this present one to carry out more investigation into this, perhaps, to authenticate this finding or make a different finding. On the other hand, Kelly (2020), Nathir (2019) and Kadiri (2017) found strong positive correlation between stigmatization and marital economic conflict among parents of autistic children whereas Ogbonna (2017) found a weak correlation between stigmatization and marital economic conflict among parents of autistic children. Thereby suggesting a no definitive conclusion status and necessitating further study such as this present one to bridge the gap.

Marital Sex Related Conflict

Marital sex related conflicts are fast becoming household issues world over. Globally, almost on a daily basis, there are numerous headlines on marital sex related conflict such that they are no longer breaking news. Adikpe (2017) described marital sex related conflict as all arguments, misunderstandings and disputes relating to sex and sexuality in family. According to Adikpe, many couples quarrel over time of sex. Adikpe advised that the ideal time of sex should be that which is convenient for both husband and wife. Hence, a spouse should consider the mood and the desire of a fellow before insisting on having sex at any particular time. However, for spouses who think that sex is only meant for child bearing, Adikpe recommended the services of marriage counselors to create more awareness on the fact while sex may be used for child bearing, it is also useful in maintaining intimacy, marital bond, pleasure and

leisure. Sciz (2017) enumerated frequency of sex and sex styles as issues that are capable of triggering marital sex related conflict between couples. According to Sciz, a spouse may differ from his or her partner in the choice of number of times to have sex in a day, week or month. Same way, couples may differ in their choices of sex styles. As trivial as these issues may sound, they are definitely capable of bringing about marital sex related conflict some of which may lead to divorce or separation if mishandled.

Reproductive health awareness is fast growing in the contemporary society. Men and women are becoming more enlightened on issues such as their rights to choices regarding their reproductive health. Consequent upon obvious incompatibility, and diversity existing among most couples, due to their different backgrounds and cultures, there are bound to be cases of misunderstandings with regard to use of contraceptives. According to Hilton (2020) religious beliefs have worsened this issue in many cases leading many people with wrong beliefs about family planning, child spacing and use of contraceptives. Hilton, however noted that some contraceptives have adverse health effect on some people due to their body chemistry. As a result, each spouse should consider his or her partners health while choosing contraceptives either for their self or for their partners. Hilton noted that choice of number of children to have has ignited marital sex related conflict among couples especially in the underdeveloped and developing countries of the world. In the view of Hilton, choice of number of children to have can only bring marital sex related conflict between couples who have sex for the purpose of child bearing only. The indices discussed above namely: time of sex, frequency of sex, sex styles, time of child birth, use of contraceptives and number of children to have form items used in the questionnaire to elicit information on marital sex related conflict in this study.

Empirical studies on relationship existing among depression, stigmatization and marital sex related conflict have shown a one-sided finding. Hilton (2020), Adoga (2020) and Adikpe (2017) found a strong positive correlation between depression and marital sex related conflict among parents of autistic children. In the same vine, Nwankwo (2019), Abubakar (2018) and Sciz (2017) found a

strong positive correlation between stigmatization and marital sex related conflict among parents of autistic children. All this findings were tilted to one side (strong positive correlation). As a result, there was need for another in-depth study such as this present one to ascertain the validity of the findings enumerated above.

Gender Influence

Gender refers to the socially, culturally constructed characteristics and roles which are ascribed to males and females in any society. According to Davidson (2020), gender or sex refers to those characteristics of males and females which are biologically determined such as possession of the male and female reproductive genital organs. Davidson further gave a broad analytical concept which draws out female role/responsibilities in relation to those of males describing the males attribute as bold, aggressive, tackful and economical use of words, while females are fearful, timid, gentle, dull, submissive and uneconomic in use of words. According to Mbang (2019), the African society generally and Nigerian society in particular also, encourage gender stereotype by giving different treatment to males and females. African and Nigerian societies frown at seeing a man cooking or a female climbing a tree. Gender discrimination cut across almost every sphere of lives of citizens of developing nations such as Nigeria. Nigeria, since she gained her independence had never produced a female President. Similarly, since the creation of ministry of gender affairs, a man has never been appointed as the minister. This portrays the ministry of gender affairs as the same with the ministry of women affairs.

From the foregoing, both gender (male and female) suffer one form of discrimination or the other in Nigeria. Hence, the tendency for male parents to view things different from their female counterparts is high. There is also a high likelihood that male and female parents will react differently when they have autistic child especially when they (male and female parents) are vulnerable to depression and stigmatization, (Nathir, 2019). Nathir found that male parents of autistic children may likely react more to stigmatization than their female counterparts despite the fact that female are usually reckoned to moody emotions. Contrarily, Mbang

(2019) found that female parents of autistic children reacted more to stigmatization than their male counterparts. Whereas Abdullahi (2017) found equal and same reaction to stigmatization from male and female parents of autistic children. Regarding depression, McDonald (2020) found that male parents of autistic children reacted more to depression than their female counterparts.

On the otherhand, Obome (2018) reported that female parents of autistic children reacted more to depression than their male counterparts. Whereas Hilton (2020) found equal and same reaction to depression from male and female parents of autistic children. These contradictions and conflicting findings necessitated the choice of this present researcher to examine if their exist any significant difference in the views or ratings or reactions of male and female parents of autistic children who suffer depression and stigmatization. Perhaps, the findings of this study will lay to rest the contradiction and conflict among researchers on gender difference with respect to the subject of this course.

CHAPTER 9

Topic:

PROBLEM-SOLVING ABILITIES AS DETERMINANTS OF SECONDARY SCHOOL STUDENTS' ACHIEVEMENT AND RETENTION IN ALGEBRA IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Problem

Problem is the situation, quantitative or otherwise, that confronts an individual or group of individuals, that requires resolution, and for which the individual sees no apparent path to the solution, Abel (2020). The key to this definition is the phrase "no apparent path." As children pursue their mathematical training, what were problems at an early age becomes exercises and eventually reduce to mere questions. These three commonly used terms are distinguished as follows:

- **Question**: a situation that can be by mere recall and memory.
- **Exercise**: a situation that involve drill and practice to reinforce a previously learned skill or algorithm.
- **Problem**: a situation that requires analysis and synthesis of previously learned knowledge to resolve.

In addition, Tinks (2019) opined that a problem must be perceived as such by the student regardless of the reason, in order to be considered a problem by them. If the student refuses to accept the challenge, it is not a problem for that student at that time. Thus, a problem must satisfy the following three criteria; Acceptance, Blockage and Exploration.

Acceptance according Tinks implies that individual accepts the problem. There is personal involvement, which may be due to any of a variety of reasons, including internal motivation, external motivation (peer, parent, and/or teacher pressure), or simply the desire to experience the enjoyment of solving problem.

Blockage means that the individual's initial attempts at solution are fruitless. His or her habitual responses and patterns of attack do not work.

Exploration refers to the personal involvement identified in the individual forces to explore new method of attack.

The resultant "problem" implies that the individual is being confronted by something they do not recognize. A situation will no longer be considered a problem once it has been modeled or can easily be solved by applying algorithms that have been previously learned. Ebinibe (2017) hinted that well-defined problems have specific goals, clearly defined solution paths, and clear expected solutions. As elucidated by Dietrich Dörner and later expanded upon by Joachim in Peters (2016), complex problems have some typical characteristics that can be summarized as follows:

Complexity (large numbers of items, interrelations and decisions), enumerability, heterogeneity, connectivity (hierarchy relation, communication relation, allocation relation), Dynamics (time considerations), temporal constraints, temporal sensitivity, phase effects, dynamic unpredictability, Intransparency (lack of clarity of the situation), commencement capacity, continuation capacity, Politely (multiple goals), inexpressiveness, opposition and transience

Of all these characteristics, Hillton (2020) submitted that those common to secondary school student include Complexity, enumerability, heterogeneity, connectivity commencement capacity and continuation capacity. There are two different types of problems, ill-defined and well defined: different approaches are used for each. Well-defined problems have specific end goals and clear expected solutions, while ill-defined problems do not. Well-

defined problems allow for more initial planning than ill-defined problems. To Alaje (2017) a problem is a situation, question or thing that causes difficulty, stress, or doubt. A problem is also a question raised to inspire thoughts.

Iyang (2016) averred that problem-solving in psychology refers to the process of finding solutions to problems encountered in life. Solutions to these problems are usually situation or context-specific.

The process starts with problem finding and problem shaping, where the problem is discovered and simplified. The next step is to generate possible solutions and evaluate them. Finally, a solution is selected to be implemented and verified. Problems have an end goal to be reached and how you get there depends upon your problem-solving ability. Problem solving ability may also refer to problem orientation that is problem solving competences and skills as well as systematic analysis. Mental health professionals study the human problem-solving processes using methods such as introspection, behaviorism, simulation, computer modeling, and experiment. Social psychologists look into the person-environment relationship aspect of the problem and independent and interdependent problem-solving abilities. Marua (2015) defined problem-solving as a higher order cognitive process and intellectual function that requires the modulation and control of more routine or fundamental skills.

According to Iyang (2016), problem-solving has two major domains: mathematical problem-solving and personal problem-solving. Both are seen in terms of some difficulty or barrier that is encountered. Empirical research shows many different strategies and factors influence everyday problem-solving. Rehabilitation psychologists studying individuals with frontal lobe injuries have found that deficits in emotional control and reasoning can be re-mediated with effective rehabilitation and could improve the capacity of injured persons to resolve everyday problems. Interpersonal everyday problem-solving is dependent upon the individual personal motivational and contextual components. According to Amadi (2019) one such component is the emotional

valence of "real world" problems and it can either impede or aid problem-solving performance. Researchers have focused on the role of emotions in problem-solving, demonstrating that poor emotional control can disrupt focus on the target task and impede problem resolution and likely lead to negative outcomes such as fatigue, depression, and inertia. In conceptualization, human problem-solving consists of two related processes: problem orientation and the motivational/attitudinal/affective approach to problematic situations and problem-solving skills. Empirical Studies suggests that abilities of the problem solver cohere with their goals and stem from the natural process of comparing oneself with others.

Concept of Problem-solving

The term problem-solving is used in many disciplines, sometimes with different perspectives, and often with different terminologies. Harry (2019) defined problem-solving as a multiple step process where the problem solver must have had relationship with past experiences (schema) and the problem at hand and then set up a solution. In other words, students need to learn this process if they are to deal successfully with problems in real life situations and those they may come across in schools. Through learning problem-solving, students should acquire ways of thinking, habits of persistence and curiosity, and confidence in unfamiliar situations that will serve them in the classroom, outside the classroom, in everyday life and in the workplace. Problem-solving is a process or means by which an individual uses previously acquired knowledge, skills, and understanding to satisfy the demands of an unfamiliar situation (Inusa, 2018). The process begins with the initial confrontation and concludes when an answer has been obtained and considered with regard to the initial conditions. The students must synthesize what they have learned and apply it to the new and different situation. King (2015) held that expertise in problem-solving develops incidentally as one solves many problems. While this may be true in part, some experts feel that problem-solving must be considered as a distinct body of knowledge and that the process should be taught as such.

Problem-solving involves collection of information and fact and the ability to use them (information and facts). Problem-solving requires analysis and synthesis. To succeed in problem-solving is to learn how to learn, (Ditu, 2019). Solving problem is an activity not unique to any particular academic discipline. Rather, problem-solving is common and applicable to solving problems in all human endeavors, however, every field and every situation call for specific knowledge, specific habits of mind, or specific abilities in solving problems.

Problem-solving is an important component of secondary education, presenting a problem and developing the skills or abilities needed to solve that problem is all that a secondary school student needs in order solve problems effectively. Marshal (2020) averred that problem-solving consists of using generic or ad hoc methods in an orderly manner to find solutions to problems Solving problems sometimes involves dealing with pragmatics, the way that context contributes to meaning, and semantics, the interpretation of the problem.

Problem-solving Abilities

Problem solving ability refers to the skill to understand what the end goal of the problem is, and what rules could be applied in solving it. Sometimes the problem requires abstract thinking or coming up with a creative solution. Problem-solving abilities are competences that one would use to find the problems that are in the way to getting to one's own goal. It is therefore possible that students with different goal orientations will adopt different problem-solving abilities, (Samuelson, 2015). Samuelson identified fourteen (14) different problem-solving abilities. They include; abstraction, analogy, brainstorming, divide and conquer, hypothesis testing, lateral thinking, means-ends analysis, morphological analysis, method of focal objects, proof, reduction, research, root cause analysis and trial and error. Samuelson hinted that the prevalent and most workable problem-solving abilities for the High school students include brainstorming, divide and conquer, lateral thinking and reduction. These four problem-solving abilities were adopted for this study since high school

students are equivalent to secondary school students in the Nigerian context. These four problems solving abilities are discussed and presented below.

Brainstorming Problem-solving Ability

According to Udabah and Nneji (2019), brainstorming is a group creativity ability by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members. In other words, brainstorming is a situation where a group of people meet to generate new ideas and solutions around a specific domain of interest by removing inhibitions. People are able to think more freely and they suggest as many spontaneous new ideas as possible. All the ideas are noted down without criticism and after the brainstorming session the ideas are evaluated. Udabah and Nneji further hinted that the term was popularized by Alex Faickney Osborn in the 1953 book Applied Imagination.

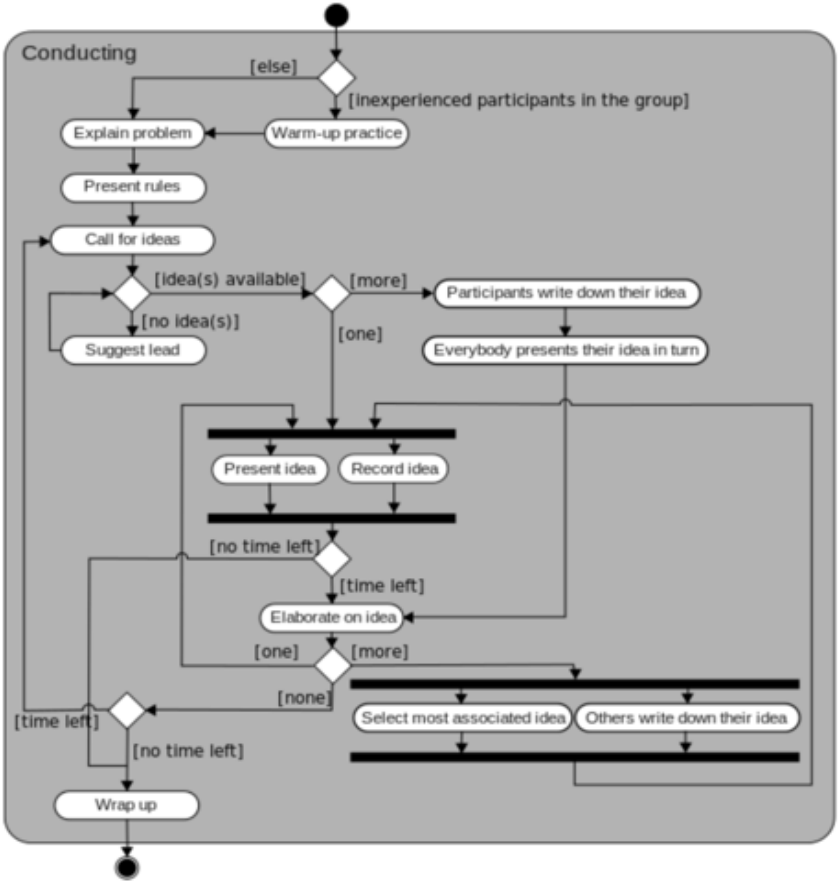
Origin

According to King (2015), advertising executive Alex F. Osborn began developing methods for creative problem-solving in 1939. He was frustrated by employees' inability to develop creative ideas individually for ad campaigns. In response, he began hosting group-thinking sessions and discovered a significant improvement in the quality and quantity of ideas produced by employees. He first termed the process as organized ideation and was later dubbed by participants as "brainstorm sessions", taking the concept after the use of "the brain to storm a problem." During the period when Osborn made his concept, he started writing on creative thinking, and the first notable book where he mentioned the term brainstorming is "How to Think Up" in 1942. Osborn outlined his method in the 1948 book Your Creative Power in chapter 33, "How to Organize a Squad to Create Ideas".

One of Osborne's key recommendations was for all the members of the brainstorming group to be provided with a clear statement of the problem to be addressed prior to the actual brainstorming session. He also explained that the guiding principle

is that the problem should be simple and narrowed down to a single target. Here, brainstorming is not believed to be effective in complex problems because of a change in opinion over the desirability of restructuring such problems. While the process can address the problems in such a situation, tackling all of them may not be feasible.

Osborn's method



Brainstorming activity conducting Osborn claimed that two principles contribute to "ideative efficacy," these being:

1. Defer judgment,
2. Reach for quantity

Following these two principles were his four general rules of brainstorming, established with intention to:

- reduce social inhibitions among group members.
- stimulate idea generation.
- increase overall creativity of the group.

1. Go for quantity: This rule is a mean of enhancing divergent production, aiming at facilitation of problem solution through the maxim quantity breeds quality. The assumption is that the greater the number of ideas generated the bigger the chance of producing a radical and effective solution.
2. Withhold criticism: In brainstorming, criticism of ideas generated should be put 'on hold'. Instead, participants should focus on extending or adding to ideas, reserving criticism for a later 'critical stage' of the process. By suspending judgment, participants will feel free to generate unusual ideas.
3. Welcome wild ideas: To get a good long list of suggestions, wild ideas are encouraged. They can be generated by looking from new perspectives and suspending assumptions. These new ways of thinking might give you better solutions.
4. Combine and improve ideas: As suggested by the slogan "1+1=3". It is believed to stimulate the building of ideas by a process of association.

Applications

Osborn notes that brainstorming should address a specific question; he held that sessions addressing multiple questions were inefficient. Further, the problem must require the generation of ideas rather than judgment; he uses examples such as generating possible names for a product as proper brainstorming material, whereas analytical judgments such as whether or not to marry do not have any need for brainstorming.

Groups

Osborn envisioned groups of around 12 participants, including both experts and novices. Participants are encouraged to provide wild and unexpected answers. Ideas receive no criticism or discussion. The group simply provide ideas that might lead to a solution and apply no analytical judgment as to the feasibility. The judgments are reserved for a later date.

Variations

Nominal group

Participants are asked to write their ideas anonymously. Then the facilitator collects the ideas and the group votes on each idea. The vote can be as simple as a show of hands in favor of a given idea. This process is called distillation. After distillation, the top ranked ideas may be sent back to the group or to subgroups for further brainstorming. For example, one group may work on the color required in a product. Another group may work on the size, and so forth. Each group will come back to the whole group for ranking the listed ideas. Sometimes ideas that were previously dropped may be brought forward again once the group has reevaluated the ideas.It is important that the facilitator be trained in this process before attempting to facilitate this technique. The group should be primed and encouraged to embrace the process. Like all team efforts it may take a few practice sessions to train the team in the method before tackling the important ideas.

Group passing

Each person in a circular group writes down one idea, and then passes the piece of paper to the next person, who adds some thoughts. This continues until everybody gets his or her original piece of paper back. By this time, it is likely that the group will have extensively elaborated on each idea. The group may also create an "idea book" and post a distribution list or routing slip to the front of the book. On the first page is a description of the problem. The first person to receive the book lists his or her ideas and then routes the book to the next person on the distribution list. The second person can log new ideas or add to the ideas of the previous person. This

continues until the distribution list is exhausted. A follow-up "read out" meeting is then held to discuss the ideas logged in the book. This technique takes longer, but it allows individuals time to think deeply about the problem.

Team idea mapping

This method of brainstorming works by the method of association. It may improve collaboration and increase the quantity of ideas, and is designed so that all attendees participate and no ideas are rejected. The process begins with a well-defined topic. Each participant brainstorms individually, then all the ideas are merged onto one large idea map. During this consolidation phase, participants may discover a common understanding of the issues as they share the meanings behind their ideas. During this sharing, new ideas may arise by the association, and they are added to the map as well. Once all the ideas are captured, the group can prioritize and/or take action.

Directed brainstorming

Directed brainstorming is a variation of electronic brainstorming (described below). It can be done manually or with computers. Directed brainstorming works when the solution space (that is, the set of criteria for evaluating a good idea) is known prior to the session. If known, those criteria can be used to constrain the ideation process intentionally. In directed brainstorming, each participant is given one sheet of paper (or electronic form) and told the brainstorming question. They are asked to produce one response and stop, then all of the papers (or forms) are randomly swapped among the participants. The participants are asked to look at the idea they received and to create a new idea that improves on that idea based on the initial criteria. The forms are then swapped again and respondents are asked to improve upon the ideas, and the process is repeated for three or more rounds. In the laboratory, directed brainstorming has been found to almost triple the productivity of groups over electronic brainstorming.

Guided brainstorming

A guided brainstorming session is time set aside to brainstorm either individually or as a collective group about a particular subject under the constraints of perspective and time. This type of brainstorming removes all cause for conflict and constrains conversations while stimulating critical and creative thinking in an engaging, balanced environment. Participants are asked to adopt different mindsets for predefined period of time while contributing their ideas to a central mind map drawn by a pre-appointed scribe. Having examined a multi-perspective point of view, participants seemingly see the simple solutions that collectively create greater growth. Action is assigned individually. Following a guided brainstorming session participants emerge with ideas ranked for further brainstorming, research and questions remaining unanswered and a prioritized, assigned, actionable list that leaves everyone with a clear understanding of what needs to happen next and the ability to visualize the combined future focus and greater goals of the group nicely.

Individual brainstorming

"Individual brainstorming" is the use of brainstorming in solitary situations. It typically includes such techniques as free writing, free speaking, word association, and drawing a mind map, which is a visual note taking technique in which people diagram their thoughts. Individual brainstorming is a useful method in creative writing and has been shown to be superior to traditional group brainstorming.

Question brainstorming

This process involves brainstorming the questions, rather than trying to come up with immediate answers and short term solutions. Theoretically, this technique should not inhibit participation as there is no need to provide solutions. The answers to the questions form the framework for constructing future action plans. Once the list of questions is set, it may be necessary to prioritize them to reach to the best solution in an orderly way."Questorming" is another term for this mode of inquiry.

Methods to improving brainstorming sessions

There are number of ways that groups can improve the effectiveness and quality of their brainstorming sessions.

- Avoiding face-to-face groups: Using face-to-face groups can increase production blocking, evaluation apprehension, social matching and social loafing.
- Stick to the rules: Brainstorming rules should be followed, and feedback should be given to members that violate these rules. Violations of brainstorming rules tend to lead to mediocre ideas.
- Pay attention to everyone's ideas: People tend to pay more attention to their own ideas, however brainstorming requires exposure to the ideas of others. A method to encourage members to pay attention to others' ideas is to make them list the ideas out or ask them to repeat others' ideas.
- Include both individual and group approaches: One method that helps members integrate their ideas into the group is brainwriting. This is where members write their ideas on a piece of paper and then pass it along to others who add their own ideas.
- Take breaks: Allow silence during group discussions so that members have time to think things through.
- Do not rush: Allow lots of time for members to complete the task. Although working under pressure tends to lead to more solutions initially, the quality is usually lower than if more time is spent on the task.
- Stay persistent: Members should stay focused and persist at the task even when productivity is low.
- Facilitate the session: A skilled discussion leader should lead and coordinate the brainstorming sessions. This leader can motivate members, correct mistakes, and provide a clear standard of work. They can also be used to keep track of all the ideas and make sure that these ideas are available to everyone.

Alternatives to brainstorming

If brainstorming does not work for your group, there are some alternatives that you could use instead.

- Buzzgroups: Larger groups can form subgroups that come up with ideas when the larger group is stumped. Afterwards, these subgroups come back together and discuss their ideas as a whole group.
- Bug list: Group members write down all the little problems or irritations concerning the issue they are working on, and then the group discusses solutions for each of these “bugs”.
- Stepladder technique: A method where new members state their ideas before listening to the group’s position.
- Synectics: A leader guides the group and discusses their goals, wishes, and frustrations using analogies, metaphors, and fantasy.

Electronic brainstorming (EBS)

Although the brainstorming can take place online through commonly available technologies such as email or interactive web sites, there have also been many efforts to develop customized computer software that can either replace or enhance one or more manual elements of the brainstorming process. Early efforts, such macrosystems at University of Arizona or Software Aided Meeting Management (SAMM) system at the University of Minnesota, took advantage of then-new computer networking technology, which was installed in rooms dedicated to computer supported meetings. When using these electronic meeting systems (EMS, as they came to be called), group members simultaneously and independently entered ideas into a computer terminal. The software collected (or "pools") the ideas into a list, which could be displayed on a central projection screen (anonymized if desired). Other elements of these EMSs could support additional activities such as categorization of ideas, elimination of duplicates, assessment and discussion of prioritized or controversial ideas. Later EMSs capitalized on advances in computer networking and internet protocols to support

asynchronous brainstorming sessions over extended periods of time and in multiple locations.

Introduced along with the EMS by Nunamaker and colleagues at University of Arizona was electronic brainstorming (EBS). By utilizing customized computer software for groups (group decision support systems or groupware), EBS can replace face-to-face brainstorming. An example of groupware is the Group Systems, a software developed by University of Arizona. After an idea discussion has been posted on Group Systems, it is displayed on each group member's computer. As group members simultaneously type their comments on separate computers, those comments are anonymously pooled and made available to all group members for evaluation and further elaboration. Compared to face-to-face brainstorming, not only does EBS enhanced efficiency by eliminating travelling and turn taking during group discussions, it also excluded several psychological constraints associated with face-to-face meetings.

Identified by Gallupe and colleagues, both production blocking (reduced idea generation due to turn-taking and forgetting ideas in face-to-face brainstorming) and evaluation apprehension (a general concern experienced by individuals for how others in the presence are evaluating them) are reduced in EBS. These positive psychological effects increase with group size. A perceived advantage of EBS is that all ideas can be archived electronically in their original form, and then retrieved later for further thought and discussion. EBS also enables much larger groups to brainstorm on a topic than would normally be productive in a traditional brainstorming session.

Computer supported brainstorming may overcome some of the challenges faced by traditional brainstorming methods. For example, ideas might be "pooled" automatically, so that individuals do not need to wait to take a turn, as in verbal brainstorming. Some software programs show all ideas as they are generated (via chat room or e-mail). The display of ideas may cognitively stimulate brainstormers, as their attention is kept on the flow of ideas being generated without the potential distraction of social cues such as facial expressions and verbal language. EBS techniques have been

shown to produce more ideas and help individuals focus their attention on the ideas of others better than a brain writing technique (participants write individual written notes in silence and then subsequently communicate them with the group). The production of more ideas has been linked to the fact that paying attention to others' ideas leads to non-redundancy, as brainstormers try to avoid to replicate or repeat another participant's comment or idea.

Conversely, the production gain associated with EBS was less found in situations where EBS group members focused too much on generating ideas that they ignored ideas expressed by others. The production gain associated with Group System users' attentiveness to ideas expressed by others has been documented by Dugosh and colleagues. EBS group members who were instructed to attend to ideas generated by others outperformed those who were not in terms of creativity. According to a meta-analysis comparing EBS to face-to-face brainstorming conducted by DeRosa and colleagues, EBS has been found to enhance both the production of non-redundant ideas and the quality of ideas produced. Despite the advantages demonstrated by EBS groups, EBS group members reported less satisfaction with the brainstorming process compared to face-to-face brainstorming group members.

Some web-based brainstorming techniques allow contributors to post their comments anonymously through the use of avatars. This technique also allows users to log on over an extended time period, typically one or two weeks, to allow participants some "soak time" before posting their ideas and feedback. This technique has been used particularly in the field of new product development, but can be applied in any number of areas requiring collection and evaluation of ideas.Some limitations of EBS include the fact that it can flood people with too many ideas at one time that they have to attend to, and people may also compare their performance to others by analyzing how many ideas each individual produces (social matching).

Incentives

Some research indicates that incentives can augment creative processes. Participants were divided into three conditions.

In Condition I, a flat fee was paid to all participants. In the Condition II, participants were awarded points for every unique idea of their own, and subjects were paid for the points that they earned. In Condition III, subjects were paid based on the impact that their idea had on the group; this was measured by counting the number of group ideas derived from the specific subject's ideas. Condition III outperformed Condition II, and Condition II outperformed Condition I at a statistically significant level for most measures. The results demonstrated that participants were willing to work far longer to achieve unique results in the expectation of compensation.

Challenges to effective group brainstorming

A good deal of research refutes Osborn's claim that group brainstorming could generate more ideas than individuals working alone. For example, in a review of 22 studies of group brainstorming, Michael Diehl and Wolfgang Stroebe found that, overwhelmingly, groups brainstorming together produce fewer ideas than individuals working separately. However, this conclusion is brought into question by a subsequent review of 50 studies by Scott G.Isaksen showed that a misunderstanding of the tool, and weak application of the methods (including lack of facilitation), and the artificiality of the problems and groups undermined most such studies, and the validity of their conclusions.Several factors can contribute to a loss of effectiveness in group brainstorming.

- **Blocking:** Because only one participant may give an idea at any one time, other participants might forget the idea they were going to contribute or not share it because they see it as no longer important or relevant.[26] Further, if we view brainstorming as a cognitive process in which "a participant generates ideas (generation process) and stores them in short-term memory (memorization process) and then eventually extracts some of them from its short-term memory to express them(output process)", then blocking is an even more critical challenge because it may also inhibit a person's train of thought in generating their own ideas and remembering them.

- **Collaborative fixation:** Exchanging ideas in a group may reduce the number of domains that a group explores for additional ideas. Members may also conform their ideas to those of other members, decreasing the novelty or variety of ideas, even though the overall number of ideas might not decrease.

- **Evaluation apprehension:** Evaluation apprehension was determined to occur only in instances of personal evaluation. If the assumption of collective assessment were in place, real-time judgment of ideas, ostensibly an induction of evaluation apprehension, failed to induce significant variance.

- **Free-writing:** Individuals may feel that their ideas are less valuable when combined with the ideas of the group at large. Indeed, Diehl and Stroebe demonstrated that even when individuals worked alone, they produced fewer ideas if told that their output would be judged in a group with others than if told that their output would be judged individually. However, experimentation revealed free-writing as only a marginal contributor to productivity loss, and type of session (i.e., real vs. nominal group) contributed much more.

- **Personality characteristics:** Extroverts have been shown to outperform introverts in computer mediated groups. Extroverts also generated more unique and diverse ideas than introverts when additional methods were used to stimulate idea generation, such as completing a small related task before brainstorming, or being given a list of the classic rules of brainstorming. Social matching: One phenomenon of group brainstorming is that participants will tend to alter their rate of productivity to match others in the group. This can lead to participants generating fewer ideas in a group setting than they would individually because they will decrease their own contributions if they perceive themselves to be more productive than the group average. On the other

hand, the same phenomenon can also increase an individual's rate of production to meet the group average.

Divide-and conquer Problem-Solving Abilities

Divide and conquer is an algorithm design paradigm based on multi-branched recursion, (marshal, 2020). A divide and-conquer problem solving ability according to Inusa (2018) work by recursively breaking down a problem into two or more sub-problems of the same or related type, until these become simple enough to be solved directly. The solutions to the sub-problems are then combined to give a solution to the original problem. This divide-and-conquer problem solving ability is the basis of efficient algorithms for all kinds of problems, such as sorting (e.g., quicksort, merge sort), multiplying large numbers (e.g. The Karatsuba algorithm), finding the closest pair of points, syntactic analysis (e.g., top-down parsers), and computing the discrete Fourier transform (FFT).

Ditu (2019) averred that understanding and designing divide-and-conquer problem solving ability is a complex skill that requires a good understanding of the nature of the underlying problem to be solved. As when proving a theorem by induction, it is often necessary to replace the original problem with a more general or complicated problem in order to initialize the recursion, and there is no systematic method for finding the proper generalization. These divide-and-conquer complications are seen when optimizing the calculation of a Fibonacci number with efficient double recursion. The correctness of a divide and-conquer algorithm is usually proved by mathematical induction, and its computational cost is often determined by solving recurrence relations.

Divide and conquer

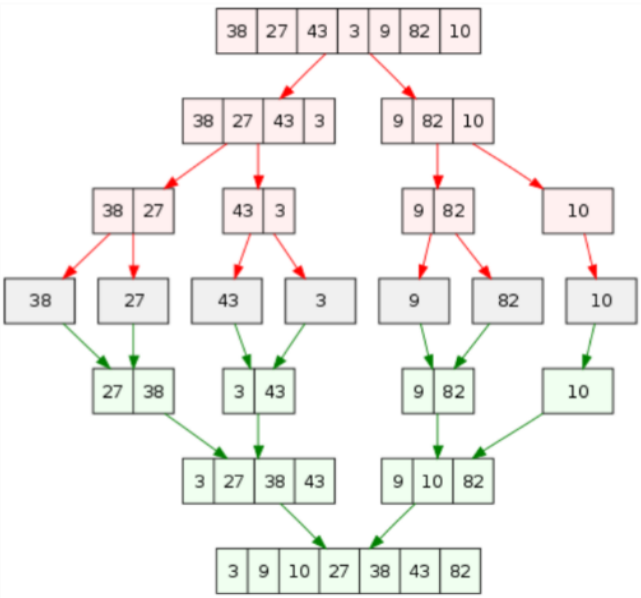


Fig.1.1

Divide-and-conquer approach to sort the list (38, 27, 43, 3, 9, 82, 10) in increasing order. Upper half: splitting into sub lists; mid: a one-element list is trivially sorted; lower half: composing sorted sub lists. The divide-and-conquer paradigm is often used to find an optimal solution of a problem. Its basic idea is to decompose a given problem into two or more similar, but simpler, sub-problems, to solve them in turn, and to compose their solutions to solve the given problem. Problems of sufficient simplicity are solved directly. For example, to sort a given list of n natural numbers, split it into two lists of about n/2 numbers each, sort each of them in turn, and interleave both results appropriately to obtain the sorted version of the given list (see the picture). This approach is known as the merge sort algorithm.

The name "divide and conquer" is sometimes applied to algorithms that reduce each problem to only one sub-problem, such as the binary search algorithm for finding a record in a sorted list (or

its analog in numerical computing, the bisection algorithm for root finding). These algorithms can be implemented more than general divide and-conquer algorithms; in particular, if they use tail recursion, they can be converted into simple loops. Under this broad definition, however, every algorithm that uses recursion or loops could be regarded as a "divide-and conquer algorithm". Therefore, some authors consider that the name "divide and conquer" should be used only when each problem may generate two or more sub-problems. The name decreases and conquer has been proposed instead for the single-sub-problem class. An important application of divide and conquer is in optimization, where if the search space is reduced ("pruned") by a constant factor at each step, the overall algorithm has the same asymptotic complexity as the pruning step, with the constant depending on the pruning factor (by summing the geometric series); this is known as prune and search.

Early historical examples

Early examples of these algorithms are primarily decrease and conquer – the original problem is successively broken down into single sub-problems, and indeed can be solved iteratively. Binary search, a decrease-and-conquer algorithm where the sub-problems are of roughly half the original size, has a long history. While a clear description of the algorithm on computers appeared in 1946 in an article by John Mauchly, the idea of using a sorted list of items to facilitate searching dates back at least as far as Babylonia in 200 BC. Another ancient decrease-and-conquer algorithm is the Euclidean algorithm to compute the greatest common divisor of two numbers by reducing the numbers to smaller and smaller equivalent sub-problems, which dates to several centuries BC. An early example of a divide and-conquer algorithm with multiple sub-problems is Gauss's 1805 description of what is now called the Cooley– Tukey fast Fourier transform (FFT) algorithm, although he did not analyze its operation count quantitatively, and FFTs did not become widespread until they were rediscovered over a century later.

An early two-sub-problem D&C algorithm that was specifically developed for computers and properly analyzed is the merge sort algorithm, invented by John von Neumann in 1945.Another notable example is the algorithm invented by Anatoli A. Karatsuba in 1960 that could multiply two n-digit numbers in $O(n^{\log_2 3})$ operations (in Big O notation). This algorithm disproved Andrey Kolmogorov's 1956 conjecture that $\Omega(n^2)$ operations would be required for that task. As another example of a divide and-conquer algorithm that did not originally involve computers, Donald Knuth gives the method a post office typically uses to route mail: letters are sorted into separate bags for different geographical areas, each of these bags is itself sorted into batches for smaller sub-regions, and so on until they are delivered. This is related to a radix sort, described for punch-card sorting machines as early as 1929.

Advantages

Solving difficult problems

Divide and conquer is a powerful tool for solving conceptually difficult problems: all it requires is a way of breaking the problem into sub-problems, of solving the trivial cases and of combining sub-problems to the original problem. Similarly, decrease and conquer only requires reducing the problem to asingle smaller problem, such as the classic Tower of Hanoi puzzle, which reduces moving a tower of height n to moving a tower of height n−1.

Algorithm efficiency

The divide-and-conquer paradigm often helps in the discovery of efficient algorithms. It was the key, for example, to Karatsuba's fast multiplication method, the quicksort and mergesort algorithms, the Strassen algorithm for matrix multiplication, and fast Fourier transforms.In all these examples, the D&C approach led to an improvement in the asymptotic cost of the solution. For example, if (a) the base cases have constant-bounded size, the work of splitting the problem and combining the partial solutions is proportional to the problem's size n, and (b) there is a bounded number p of sub-problems of size ~ n/p at each stage, then the cost of the divide-and-conquer algorithm will be $O(n \log_o n)$.

Parallelism

Divide-and-conquer algorithms are naturally adapted for execution in multi-processor machines, especially shared memory systems where the communication of data between processors does not need to be planned in advance, because distinct sub-problems can be executed on different processors.

Memory access

Divide-and-conquer algorithms naturally tend to make efficient use of memory caches. The reason is that once a sub-problem is small enough, it and all its sub-problems can, in principle, be solved within the cache, without accessing the slower main memory. An algorithm designed to exploit the cache in this way is called cache-oblivious, because it does not contain the cache size as an explicit parameter.

Moreover, D&C algorithms can be designed for important algorithms (e.g., sorting, FFTs, and matrix multiplication) to be optimal cache-oblivious algorithms–they use the cache in a probably optimal way, in an asymptotic sense, regardless of the cache size. In contrast, the traditional approach to exploiting the cache is blocking, as in loop nest optimization, where the problem is explicitly divided into chunks of the appropriate size—this can also use the cache optimally, but only when the algorithm is tuned for the specific cache size(s) of a particular machine. The same advantage exists with regards to other hierarchical storage systems, such as NUMA or virtual memory, as well as for multiple levels of cache: once a sub-problem is small enough, it can be solved within a given level of the hierarchy, without accessing the higher (slower) levels.

Round-off control

In computations with rounded arithmetic, e.g. with floating-point numbers, a divide-and conquer algorithm may yield more accurate results than a superficially equivalent iterative method. For example, one can add N numbers either by a simple loop that adds each datum to a single variable, or by a D&C algorithm called pairwise summation that breaks the data set into two halves, recursively computes the sum of each half, and then adds the two

sums. While the second method performs the same number of additions as the first, and pays the overhead of the recursive calls, it is usually more accurate.

Implementation issues

Recursion

Divide-and-conquer algorithms are naturally implemented as recursive procedures. In that case, the partial sub-problems leading to the one currently being solved are automatically stored in the procedure call stack. A recursive function is a function that calls itself within its definition.

Explicit stack

Divide-and-conquer algorithms can also be implemented by a non-recursive program that stores the partial sub-problems in some explicit data structure, such as a stack, queue, or priority queue. This approach allows more freedom in the choice of the sub-problem that is to be solved next, a feature that is important in some applications — e.g. in breadth first recursion and the branch and-bound method for function optimization. This approach is also the standard solution in programming languages that do not provide support for recursive procedures.

Stack size

In recursive implementations of D&C algorithms, one must make sure that there is sufficient memory allocated for the recursion stack, otherwise the execution may fail because of stack overflow. D&C algorithms that are time efficient often have relatively small recursion depth. For example, the quicksort algorithm can be implemented so that it never requires more than nested recursive calls to sort items.

Stack overflow may be difficult to avoid when using recursive procedures, since many compilers assume that the recursion stack is a contiguous area of memory, and some allocate a fixed amount of space for it. Compilers may also save more information in the recursion stack than is strictly necessary, such as

return address, unchanging parameters, and the internal variables of the procedure. Thus, the risk of stack overflow can be reduced by minimizing the parameters and internal variables of the recursive procedure or by using an explicit stack structure.

Choosing the base cases

In any recursive algorithm, there is considerable freedom in the choice of the base cases, the small sub-problems that are solved directly in order to terminate the recursion. Choosing the smallest or simplest possible base cases is more elegant and usually leads to simpler programs, because there are fewer cases to consider and they are easier to solve. For example, an FFT algorithm could stop the recursion when the input is a single sample, and the quicksort list-sorting algorithm could stop when the input is the empty list; in both examples there is only one base case to consider, and it requires no processing.

On the other hand, efficiency often improves if the recursion is stopped at relatively large base cases, and these are solved non-recursively, resulting in a hybrid algorithm. This strategy avoids the overhead of recursive calls that do little or no work, and may also allow the use of specialized non-recursive algorithms that, for those base cases, are more efficient than explicit recursion. A general procedure for a simple hybrid recursive algorithm is short-circuiting the base case, also known as arm's length recursion. In this case whether the next step will result in the base case is checked before the function call, avoiding an unnecessary function call. For example, in a tree, rather than recursing to a child node and then checking whether it is null, checking null before recursing; this avoids half the function calls in some algorithms on binary trees. Since a D&C algorithm eventually reduces each problem or sub-problem instance to a large number of base instances, these often dominate the overall cost of the algorithm, especially when the splitting/joining overhead is low. Note that these considerations do not depend on whether recursion is implemented by the compiler or by an explicit stack.

Thus, for example, many library implementations of quicksort will switch to a simple loop-based insertion sort (or

similar) algorithm once the number of items to be sorted is sufficiently small. Note that, if the empty list were the only base case, sorting a list with n entries would entail maximally n quicksort calls that would do nothing but return immediately. Increasing the base cases to lists of size 2 or less will eliminate most of those do-nothing calls, and more generally a base case larger than 2 is typically used to reduce the fraction of time spent in function-call overhead or stack manipulation. Alternatively, one can employ large base cases that still use a divide-and-conquer algorithm, but implement the algorithm for predetermined set of fixed sizes where the algorithm can be completely unrolled into code that has no recursion, loops, or conditionals (related to the technique of partial evaluation).

For example, this approach is used in some efficient FFT implementations, where the base cases are unrolled implementations of divide-and-conquer FFT algorithms for a set of fixed sizes. Source-code generation methods may be used to produce the large number of separate base cases desirable to implement this strategy efficiently. The generalized version of this idea is known as recursion "unrolling" or "coarsening", and various techniques have been proposed for automating the procedure of enlarging the base case.

Sharing repeated sub-problems

For some problems, the branched recursion may end up evaluating the same sub-problem many times over. In such cases it may be worth identifying and saving the solutions to these overlapping sub-problems, a technique commonly known as memorization. Followed to the limit, it leads to bottom-up divide-and-conquer algorithms such as dynamic programming and chart parsing.

Lateral thinking problem solving ability

Lateral thinking is a manner of solving problems using an indirect and creative approach via reasoning that is not immediately obvious. According to Samuelson (2015) the term was promulgated in 1967 by Edward de Bono. He cites the Judgment of Solomon as

an example, where King Solomon resolves a dispute over the parentage of a child by calling for the child to be cut in half, and making his judgment according to the reactions that this order receives. Edward de Bono also links lateral thinking with humor, arguing there's a switch-over from a familiar pattern to a new, unexpected one.

It is this moment of surprise, generating laughter and new insight, which facilitates the ability to see a different thought pattern which initially was not obvious. According to de Bono, lateral thinking deliberately distances itself from the standard perception of creativity as "vertical" logic, the classic method for problem-solving.

Methods

Lateral thinking has to be distinguished from critical thinking. Critical thinking is primarily concerned with judging the true value of statements and seeking errors. Lateral thinking is more concerned with the "movement value" of statements and ideas. A person uses lateral thinking to move from one known idea to creating new ideas. Edward de Bono defines four types of thinking tools:

1. idea-generating tools intended to break current thinking patterns—routine patterns, the status quo focus tools intended to broaden where to search for new ideas.
2. harvest tools intended to ensure more value is received from idea generating output.
3. treatment tools that promote consideration of real-world constraints, resources, and support.
4. Random Entry Idea Generating Tool The thinker chooses an object at random, or a noun from a dictionary, and associates it with the area they are thinking about.

De Bono gives the example the randomly-chosen word "nose" being applied to an office photocopier, leading to the idea that the copier could produce a lavender smell when it was low on paper, to alert staff.

Provocation Idea Generating Tool

A provocation is a statement that we know is wrong or impossible but is used to create new ideas. De Bono gives an example of considering river pollution and setting up the provocation "the factory is downstream of itself"; this leads to the idea of forcing a factory to take its water input from a point downstream of its output, an idea which later became law in some countries. Provocations can be set up by the use of any of the provocation techniques—wishful thinking, exaggeration, reversal, escape, distortion, or arising. The thinker creates a list of provocations and then uses the most outlandish ones to move their thinking forward to new ideas.

Movement ability

One can move from a provocation to a new idea by the following methods: extract a principle, focus on the difference, moment to moment, positive aspects, special circumstances.

Challenge Idea Generating Tool

A tool which is designed to ask the question "Why?" in a non-threatening way: why something exists, why it is done the way it is. The result is a very clear understanding of "Why?" which naturally leads to fresh new ideas. The goal is to be able to challenge anything at all, not just items which are problems. For example, one could challenge the handles on coffee cups: The reason for the handle seems to be that the cup is often too hot to hold directly; perhaps coffee cups could be made with insulated finger grips, or there could be separate coffee-cup holders similar to beer holders, or coffee shouldn't be so hot in the first place.

Concept Fan Idea Generating Tool

Ideas carry out concepts. This tool systematically expands the range and number of concepts in order to end up with a very broad range of ideas to consider. Disproving Based on the idea that the majority is always wrong (as suggested by Henrik Ibsen and by John Kenneth Galbraith), take anything that is obvious and generally accepted as "goes without saying", question it, take an opposite

view, and try to convincingly disprove it. This technique is similar to de Bono's "Black Hat" of Six Thinking Hats, which looks at identifying reasons to be cautious and conservative.

Problem-solving

When something creates a problem, the performance or the status quo of the situation drops. Problem-solving deals with finding out what caused the problem and then figuring out ways to fix the problem. The objective Problem-solving. This section does not cite any sources. Learn more is to get the situation to where it should be. For example, a production line has an established run rate of 1000 items per hour. Suddenly, the run rate drops to 800 items per hour. Ideas as to why this happened and solutions to repair the production line must be thought of, such as giving the worker a pay raise.

Creative Problem-solving

Using creativity, one must solve a problem in an indirect and unconventional manner. For example, if a production line produced 1000 books per hour, creative problem-solving could find ways to produce more books per hour, use the production line, or reduce the cost to run the production line.

Lateral Problem "Solving"

Lateral thinking will often produce solutions whereby the problem appears as "obvious" in hindsight. That lateral thinking will often lead to problems that you never knew you had, or it will solve simple problems that have a huge potential. For example, if a production line produced 1000 books per hour, lateral thinking may suggest that a drop in output to 800 would lead to higher quality, and more motivated workers. Lateral thinking "puzzles" * Lateral thinking puzzles are supposed to demonstrate what lateral thinking is about. However, any puzzle that has only one solution been "not" lateral. While lateral thinking may help you construct such puzzles, the lateral thinking tools will seldom help you solve puzzles.

Reduction Problem Solving Ability

This problem-solving ability also referred to as problem reduction involves the use of fundamental characteristics of human reasoning. In this problem-solving framework, a complex problem is decomposed into simpler sub problems. When these sub-problems are solved, the solutions are then assembled into an overall solution to the original complex problem. By decomposing a problem, the learner aims at uncovering subordinated problems for which the solutions are much easier or even trivial. A good example of application of the problem reduction ability is treating problems as questions. This is done by starting with a question formulated in a certain logical language and proposing to organizing problem-solving as finding answers to the questions and finally, integrating the answers to one answer for the original question (problem).

Algebra

According to Bill (2017), Algebra (from Arabic al-jebr meaning "reunion of broken parts") is the branch of mathematics concerning the study of the rules of operations and relations, and the constructions and concepts arising from them, including terms, polynomials, equations and algebraic structures. Together with geometry, analysis, topology, combinatiorics, and number theory, algebra is one of the main branches of pure mathematics. Also Kofi (2018) states that algebra originated from the Arabic "al-jabr" meaning "the mending of broken parts". Hence, He defined algebra as the part of mathematics in which letters and other general symbols are used to represent numbers and quantities in formulae and equations. Letter and symbols used to represent numbers and quantities, in formulae and equations are usually called "unknowns". Algebra may therefore, be defined as a system of representing numbers and quantities with unknowns in equations based on given axioms.

Kwame & Damtez (2018) observed that elementary algebra, often part of the curriculum in secondary education, introduces the concept of variables representing numbers. Statements based on these variables are manipulated using the rules of operations that

apply to numbers, such as addition. This can be done for a variety of reasons, including equation solving. However, Algebra is much broader than elementary algebra and studies what happens when different rules of operations are used and when operations are devised for things other than numbers. Addition and multiplication can be generalized and their precise definitions lead to structures such as groups, rings and fields, studied in the area of mathematics called abstract algebra.

EL-Anin and Husseini (2018) narrated that by the time of Plato, Greek mathematics had undergone a drastic change. The Greeks created a geometric algebra where terms were represented by sides of geometric objects, usually lines, that had letters associated with them. EL-Anin and Hussein, further held that Diophantus (3rd century AD), sometimes called "the father of algebra", was an Alexandrian Greek mathematician and the author of a series of books called Arithemtica. These texts deal with solving algebraic equations.

While the word algebra comes from the Arabic language (al-jabr "restoration") and much of its methods from Arabic/Islamic mathematics, its roots can be traced to earlier traditions, which had a direct influence on Muhammad Ibn Musa al-Khwarizmi (c. 780-850). He later wrote The Compendious Book on Calculation by Completion and Balancing, which established algebra as a mathematical discipline that is independent of geometry and arithmetic, According Zack and Young (2019) the roots of algebra can be traced to the ancient Babylonians, who developed an advanced arithmetical system with which they were able to do calculations in an algorithmic fashion. The Babylonians developed formulas to calculate solutions for problems typically solved today by using linear equations, quadratic equations, and indeterminate linear equations. By contrast, most Egyptians of this era, as well as Greek and Chinses mathematicians in the 1st millennium BC, usually solved such equations by geometric methods, such as those described in the Rhind Mathematical Papyrus, Euclid's Elements, and The Nine Chapters on the Mathematical Art. The geometric work of the Greeks, typified in the Elements, provided the framework for generalizing formulae beyond the solution of

particular problems into more general systems of stating and solving equations, though this would not be realized until the medieval Muslim mathematicians. Kofi (2018).

Ajom and Agbenyi (2019) asserted that the Hellenistic mathematicians Hero of Alexandria and Diophantus as well as Indian mathematicians such as Brahmagupta continued the traditions of Egypt and Babylon, though Diophantus' Arithmetica and Brahmagupta's Brahmasphutasiddhanta were on a higher level. For example, the first complete arithmetic solution (including zero and negative solutions) to quadratic equations was described by Brahmagupta in his book Brahmasphutasiddhanta. Later, Arabic and Muslim mathematicians developed algebraic methods to a much higher degree of sophistication. Although Diophantus and the Babylonians used mostly special adhoc methods to solve equations. According to Kofi (2018) Al-Khwarizmi was the first to solve equation using general methods. He solved the linear indeterminate equations, quadratic equations, second order indeterminate equations and equations with multiple variables.

Stone (2017) further reported that in 1545, the Italian mathematician Girolamo Cardano published Ars magna – the great art, a 40-chapter masterpiece in which he gave for the first time a method for solving the general quartic equation. The Greek mathematician Diophantus has traditionally been known as the "father of algebra" but in more recent times there is much debate over whether al-Khwarizmi, who founded the discipline of al-jabr, deserves that title instead. Those who support Diophantus point to the fact that the algebra found in Al-Jabr is slightly more elementary than the algebra found in Arithmetica and that Arithmetica is syncopated while Al-Jabr is fully rhetorical. Those who support Al-Khwarizmi point to the fact that he introduced the methods of "reduction" and "balancing" (the transposition of subtracted terms to the other side of an equation, that is, the cancellation of like terms on opposite sides of the equation) which the term al-jabr originally referred to, and that he gave an exhaustive explanation of solving quadratic equations, supported by geometric proofs, while treating algebra as an independent discipline in its own right. His algebra was also no longer concerned "with a series of problems to be

resolved, but an exposition which starts with primitive terms in which the combinations must give all possible prototypes for equations, which explicitly constitute the true object of study." He also studied an equation for its own sake and "in a generic manner, insofar as it does not simply emerge in the course of solving a problem, but is specifically called on to define an infinite class of problems.

More-so, Zack and Young (2019) held that the Persian mathematician Omar Khayyam is credited with identifying the foundations of algebraic geometry and found the general geometric solution of the cubic equation. Another Persian mathematician, Sharaf al-Din al-Tusi, found algebraic and numerical solutions to various cases of cubic equations. He also developed the concept of a function. The Indian mathematicians Mahavira and Bhaskara II, the Persian mathematician Al-Karaji, and the Chinese mathematician Zhu Shijie, solved various cases of cubic, quartic, quintic and higher-order polynomial equations using numerical methods. In the 13th century, the solution of a cubic equation by Fibonacci is representative of the beginning of a revival in European algebra. As the Islamic world was declining, the European world was ascending. And it is here that algebra was further developed.

For Ajom and Agbenyi (2019), Francois Viets's work at the close of the 16th century marks the start of the classical discipline of algebra. In 1637, Rene Descartes published La Geometrie, inventing analytic geometry and introducing modern algebraic notation. Another key event in the further development of algebra was the general algebraic solution of the cubic and quartic equations, developed in the mid-16th century. The idea of a determinant was developed by Japanese mathematician Kowa Seki in the 17th century, followed independently by Gottfried Leibniz ten years later, for the purpose of solving systems of simultaneous linear equations using matrices. Gabriel Cramer also did some work on matrices and determinants in the 18th century. Permutations were studied by Joseph Lagrange in his 1770 paper Reflexions sur la resolution algebrique des equations devoted to solutions of algebraic equations, in which he introduced Lagrange resolvents. Paolo Ruffini was the first person to develop the theory of permutation

groups, and like his predecessors, also in the context of solving algebraic equations. Bill (2017) further related that abstract algebra was developed in the 19th century, initially focusing on what is now called Galois Theory, and on constructability issues. The "modern algebra" has deep nineteenth-century roots in the work, for example, the works of Richard Dedekind and Leopold Kronecker have profound interconnections with other branches of mathematics such as algebraic number theory and algebraic geometry. George Peacock was the founder of axiomatic thinking in arithmetic and algebra. Augustus De Morgan discovered relation algebra in his Syllabus of a Proposed System of Logic. Josiah Willard Gibbs developed an algebra of vectors in three-dimensional space, and Arthur Cayley developed an algebra of matrices which is a noncommutative algebra, (King, 2015).

According to Stone (2017), Algebra may be divided roughly into the following categories:

- **Elementary Algebra,** in which the properties of operations on the real number system are recorded using symbols as "place holders" to denote constants and variables, and the rules governing mathematical expressions and equations involving these symbols are studied. This is usually taught as school under the title algebra (or intermediate algebra and college algebra in subsequent years). University-level courses in group theory may also be called elementary algebra.

- **Abstract Algebra,** sometimes also called modern algebra, in which algebraic structures such as groups, rings and fields are axiomatically defined and investigated.

- **Linear Algebra,** in which the specific properties of vector spaces are studied (including matrices);

- **Universal Algebra,** in which properties common to all algebraic structures are studied.

- **Algebraic number theory,** in which the properties of numbers are studied through algebraic systems. Number theory inspired much of the original abstraction in algebra.

- **Algebraic geometry** applies abstract algebra to the problems of geometry.

- **Algebraic combinatorics,** in which abstract algebraic methods are used to study combinatorial questions. In some directions of advanced study, axiomatic algebraic systems such as groups, rings, fields, and algebras over a field are investigated in the presence of a geometric structure (a metric or a topology) which is compatible with the algebraic structure. The list includes a number of areas of functional analysis. From the above classification, this work was based on elementary algebra which is the algebra studied at secondary education level.

Stone (2017) further elaborated that elementary algebra is the most basic form of algebra. It is taught to students who are presumed to have no knowledge of mathematics beyond the basic principles of arithmetic. In arithmetic, only numbers and their arithmetical operations (such as +, -, x, ÷) occur. In algebra, numbers are often denoted by symbols (such as a, x, y, p,q, etc). This is useful because of the following reasons;

1. It allows the general formulation of arithmetical laws (such as a + b = b + a for all a and b), and thus is the first step to a systematic exploration of the properties of the real number system.
2. It allows the reference to "unknown" numbers, the formulation of equations and the study of how to solve these. (For instance, "find a number x such that 3x + 1 = 10" or going a bit further "find a number x such that ax + b = c". This step leads to the conclusion that it is not the nature of the specific numbers that allows us to solve it, but that of the operations involved.)

3. It allows the formulation of functional relationships. (For instance, "if you sell x tickets, then your profit will be 3x – 10 naira, or f(x) = 3x – 10, where f is the function, and x is the number to which the function is applied.")

From the review presented above it is evident that algebra is one of the major, if not the most important branch of pure mathematics. Of greater interest to this study is the fact that algebra constitutes over 46 percent of secondary school mathematics curriculum in Nigeria. yet secondary school students tend to fear and avoid algebraic topic, (Ajom and Agbenyi, 2019). Consequently, the choice of algebra as the branch of mathematics used for this study is justified.

Concept of Achievement

Samuelson (2015) asserted that the word "achievement" is the noun form of the verb "achieve". Hence, achievement is the process of bringing about or accomplishing something through effort, skill or courage. In this work, achievement strictly refers to academic achievement and more specifically, academic achievement in secondary school students' mathematics. Academic achievement generally suggests an achievement relating to education and scholarship. (Mayo, 2017). According to Jacobs (2018), academic achievement depicts students' performance on a standard of measurement such as performance test, skill test, analytical thinking test, etc. It is therefore, not out of place to describe academic achievement as the gain in knowledge of students as a result of taking part in a learning activity or programme. Learning here refers to changes in a person's behavioral repertoire rather than just a change in behaviour. Academic achievement is a result-oriented construct that encapsulates the extent of performance of a desired task. (Rix, 2020).

Jumoh (2017) argued that since academic achievement is a measure of students' success in an academic setting, it is therefore, the goal of parents, teachers and school administrators to foster achievement. Iyang (2016) stated that students' achievement in mathematics, just like every other school subjects is usually done using assignments, projects, tests and examinations. These

achievement measurement tools are used to assess (evaluate) the worth of the students' learning and as well predict their future academic endeavors. In this study, students' achievement in mathematics shall be measured using the Mathematics Achievement Test (CEAT). Rix (2020) affirmed the validity of the use of achievement tests especially in research studies designed to determine the effectiveness of two or more instructional strategies and or methods.

Similarly, Hanks (2017) advanced that the major advantage of use of achievement tests is that apart from estimating the relative effectiveness of an innovation, achievement tests also identify areas of weaknesses in innovative techniques, thereby paving way for remedial action(s). This study therefore, shall not only use the Mathematics Achievement Test to infer on the efficacy of the methods under study, but shall as well use its results or findings to proffer veritable ways of maximizing the use of those teaching methods in circumstances where any of them becomes the most appropriate. Tsui (2016) identified some factors that could determine students' achievement. They include teacher-qualification, teacher's knowledge of the subject matter and ability to deliver effectively, environment, students' state of mind, students' readiness, teaching method, availability, utilization and suitability of instructional aids and teacher motivation. In the same vein, Amajo (2016) grouped the factors under three broad sub-headings viz; teacher-related, student-related and environmental factors. Further-more, Umar (2019) classified the factors as follows; Knowledge-oriented, economic-oriented, psychological and environmental. The list is endless. However, this study shall restrict itself to only teaching method as a determinant of students' achievement. Hence, concerted efforts shall be made to ensure that any observation made in the students' achievement can genuinely be attributed to the treatment administered. In specific terms, this study intends to ascertain the effect of meta-cognitive strategy on students' achievement in mathematics.

Concept of Retention

Retention is the noun form of the verb "Retain". Ebinibe (2017) defined retain as "keep"; "continue to have or hold" or "keep in place". In the same vein, Kofi (2018) defined retain as "keep possession of", "absorb and hold" or "keep in place". It follows therefore, that retention, which is the act of retaining, maybe defined as the act of "absorbing and holding" or "to continue having or holding". In the context of this work, retention refers to the act of absorbing, holding, or continuing to hold or have facts or things learned. On problems of retention, Dulton (1975) in Ahmadi (2019) asserted that failure to provide enough applications to real life activity and social usage cum poor teaching techniques are strong limiting factors to students' retention in mathematics. Similarly, Gagne (1977) in Iyang (2016) contended that for improvement of retention of learned materials in mathematics, programmed learning is indispensable. Retention, thus, depends mainly on teaching strategy adopted by the teacher.

Inusa (2018) investigated the effect of meta-cognitive strategies on students' achievement and retention in mathematics. Data analysis in that quasi-experimental design revealed that students taught mathematics using meta-cognitive strategy achieved better and retained more than those taught with the expository method. Memory and learning are so closely related in meaning and functions that sometimes they are used interchangeably. For example, the definition of Learning as adopted by most educators describes it as "a relatively permanent change in potential behaviour which is acquired through practice or experience. The word "relatively permanent" in the definition connotes something stored or locked up somewhere and this is exactly what the memory is all about. Also the word "potential behaviour' implies something for a "later use" and this is the retrieval aspect of memory. Therefore, learning implies memory and memory implies learning. (Tinks, 2017).

About memory, if there is any living organism that can use the past to live the present and shape the future that organism is human being. His capacity to store experience and retrieve it for use in daring situations places him above all other living creatures.

According to Abel (2019) memory is the storage and retrieval of things learned earlier. It is simply the ability or the power to store facts in the conscious mind and recall them for use in a later situation.

Abel further enumerated the following functions of memory;

1. It allows the storage of information, that is, preservation of past experience.
2. It allows the retrieval of stored information for use when needed.

The other functions derive directly from functions 1 and 2 above.

3. It allows human beings to organize their lives
4. It saves people from danger through recognition
5. It places human beings above other creatures
6. It enhances our innovativeness and creativity through convergent and divergent thinking.
7. It allows human beings to control their lives.

On how the memory operates, Atkinson and Shiffrin (1968), in Okafor (2019) state that experience get stored in stages. Precisely they mention a sequential–three–stage process, starting with Sensory Register Short Term Store and then the Long term store illustrated by (the figure) adapted from Morgan et al (1979) and shown below;

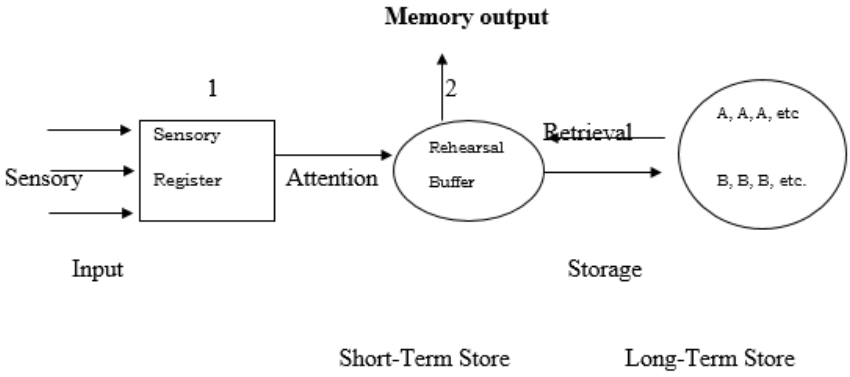


Figure 1: Morgan et al (1979) memory three – stage process model.

Stage 1: Sensory input is received. Here the sense organs of sight (eye), hearing (Ear), touch (Skin), smelling (nostril) and tasting (tongue) are active in the sense that they receive stimulation from the environment and briefly store it for about one to few seconds. In a nutshell, the sense organs are the Sensory Registers for sensory inputs from the environment. The sensory register receives, processes and sends to the second stage. The processing done by the sensory register is simple giving attention to the input. Any input not giving attention is ignored, discarded, or forgotten. It is only those held briefly for one to few seconds (attended to) that are pushed to the next stage.

Stage 2: The second stage is the short term store or short term memory. As soon as the input is received from sensory register (stage 1) the short term store processes it by rehearsing it. This is why this second stage is referred to as rehearsal buffer. It is holding stage where input is held for about 30 seconds. To rehearse is to repeat over and over. After rehearsal, the information in input is pushed to the third stage which is the long term store. For information to pass to the third stage, it has to be processed, that is, rehearsed, if not, such information is lost or forgotten.

Stage 3: This stage belongs to the Long-term store. It receives well-rehearsed information form the short-term store. Its function includes receiving and organizing information into categories. This categorization could be done alphabetically or chronologically. Such as all A^s together, all B^s together, all C^s together or in the order of 1,2,3,4,5 etc. The Long term memory can hold information for days, for weeks, for months, for years or for life time.

In the words of Buba (2010), it is a fact that our memory (LTM) has a tremendous capacity for encoding information. But then, how do we know that something at all is in our memory. This is done by measuring retention. We measure retention through:

Recognition, Recall and Relearning

In recognition a correct answer within other answers is presented to a subject (a person) who is expected to recognize and select the correct answer among the available. In recall subjects or respondents are not presented with any answers at all, whether right or wrong. They are expected to supply the answers. While in relearning if a subject is to relearn already learned materials, he is expected to relearn this same material using lesser time than when he first learned it. The time saved (saving time) is result of practice effect. It is measured thus:

$$\text{Saving Time} = \frac{\text{Original Learning Time} - \text{Relearning Time}}{\text{Original Learning Time}} \times 100$$

The retention here is the time saved in relearning. Hiz (2018) added a fourth one as reproduction. He explained reproduction as a measure of learning that involves remembering accurately in order to recall verbatim.

Buba further explained that retrieval fit is possible because it is aided by retrieval cues. The cues play the role of reminders. For example, chair could be a retrieval cue for table, soldier a retrieval cue for war, husband for wife and rice for stew. Okafor (2019) submitted that the retrieval cue or reminder to be effective, it should be coded with the learned material at the point of learning. This approach he described as "encoding specificity principle." It should be noted that people tend to provide their own retrieval cues even when non is readily available. Another submission by Keko (2017) say retrieval is possible through "tagging" and "cueing." This theory, - generation, recognition or tagging theory – says a tag is giving to an item to be remembered at the time it is being encoded for storage in LTM. The retrieval process starts with a cue. This cue makes us to generate a search for the tagged item through the portion

of memory to which we have been directed by the cue. Undoubtedly, what is not retained if forgotten. It follows therefore, that we cannot not explain retention fully without the mention of forgetting.

Curve of Forgetting

Bliss (2019) concluded that the general pattern of loss of retention is that greatest loss do occur immediately after acquisition, with the rate of loss diminishing after that. This has come to be known as curve of forgetting.

The figure below amply illustrates this.

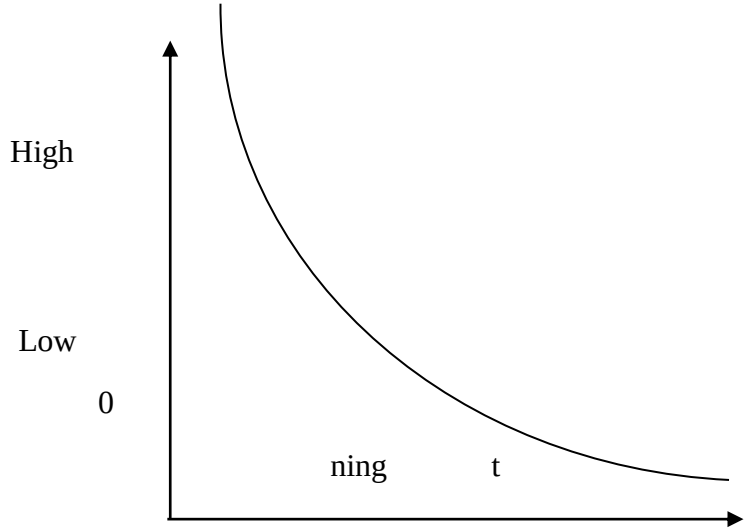


Figure 2: Herman Ebbinghaus Curve of Forgetting model.

On Problems in Retention, Mayo (2017) wrote two major problems exist concerning our effort to retrieve learned materials from long term memory. They are:

Tip-of-the-tongue phenomenon and Confabulation

These two problems make retrieval difficult.

In Tip-of-the-Tongue Phenomenon sometimes we try to remember something e.g. a name. We have such names at the tip of the tongue but not in the memory. The name keeps going back. We may sometimes remember the starting alphabets Fa…….. something or sometimes the sound of the name. This is what Bliss described as the tip-of-the-tongue phenomenon.

Bliss explained that confabulation**:** Is due to over-excitement of high motivation to remember something. In the process we excitedly manufacture a report that seems appropriate and we tend to believe it to be true, whereas it is false or wrong. Confabulation is therefore facts mixed with fictions which is believed to be true. Everyone confabulates to some extent. We have the ability to close gaps in perceptual situations. Therefore, we simply get few key features and fill in the rest. The major interest of this study is to proffer solutions to problems of retention, that is, finding out ways of improving retention or memory. Hence, the study intends to verify the effect of the teaching methods under study on students' retention of the learned material.

Influence of School Location

Location in the context of this study was categorized into two viz; urban and rural. Undoubtedly, urbanization and rural development still pose great challenges to the government of the third world countries such as Nigeria. In the urban areas, barely all the basic infrastructures are inadequate in supply, hence, the struggle for and consequent over stretching of the available few. Therefore, in school system, the story has remained that of over-crowded classrooms, insufficient and obsolete equipment, absenteeism occasioned by the use of school children for street trading even during the school hours, truancy on the part of the teachers as they hassle to survive the high cost living and other conditions that may affect the problem-solving abilities of secondary school secondary school students. The emergency of urban congestions have worsened things and created more unmanageable social problems. The problems of urbanization are many and they constitute a big threat to secondary school students' development and nation building.

On the other hand, the situation in the rural areas is not in any way better. Although the rural locations may never be known for over-population, they have definitely suffered neglect and abandonment, hence, schools in the rural areas are marked by dilapidated buildings, where they even exist at all and lack of necessary equipments to enhance teaching and learning. Many rural schools have been deserted by teachers who usually seek transfers to urban areas. All these largely tell on the secondary school students who evidently become most vulnerable and this may influence their problem-solving abilities. Thus, a study of this nature is most timely as it also seeks to investigate whether location of schools can influence the problem-solving abilities of secondary school secondary school students exposed to different problem-solving abilities.

Hilton (2020) submitted that rural parents are usually shy and this affects their influence on their children and wards. Ahmadi (2019) opined that rural students are usually shy and may likely be influenced more by their parental socioeconomic status than their counterparts in the urban areas. Kofi (2018) posited that location has very little or no influence on a person's problem-solving abilities. Bill (2017) attempted to link location and environment. According to Peters (2016), location and environment are two inseparable terms when it comes to issues pertaining education, training and development of secondary school students. Although Peters did not classify urban and rural areas as favorable and unfavorable environment can both be found in some rural as well as in some urban locations.

Kame and Damte (2018) supported this claim, hinting that urban areas have "ghettoes" as well as "GRA" and well-designed residential and industrial layouts. Similarly, a rural location may have conducive and unconducive areas for proper moral training. Kame and Damte further averred that while secondary school students in urban areas may have easier access to knowledge of evil or risky behaviors, such secondary school students may as well gain easier access to knowledge of the dangers of involving in such risky behaviors. This consequently may influence their problem-solving abilities. Furthermore, student's ignorance may constitute more

harm (danger) to him/her and other people around him/her. Unarguably, location is a factor that cannot be under played in discussing secondary school students' development and problem-solving abilities. Location, as an environmental factor affects the parents as well as the secondary school students. Location, as an environmental factor influences teaching, learning and other activities. Location, as a factor of socialization affects all stages of human development. Hence, researchers should not relax and accept the no definitive conclusion status on the influence of location on secondary school students' especially with regard to their problem-solving abilities. There is need for further investigations on this issue so as to bridge this harmful gap of conflicting findings. Therefore, this present study is, to say the least, most timely.

CHAPTER 10

Topic:

COUNSELING STRATEGIES ADOPTED BY SECONDARY SCHOOL PRINCIPALS FOR CONFLICT MANAGEMENT IN SECONDARY SCHOOLS IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Counseling

Counseling has become an important component in secondary school education. Apart from guiding the students in career choices and in the areas they are likely to perform better, counseling has become an instrument to reduce emotional tension among students from broken homes, single parents and poor performance in educational pursuit. There is no conversion on the definition of Counseling. This is because various authors have various definitions based on his perception of the concept and on the environment in which he is writing. Pinto (2017) for instanced defined Counseling as a discussion of an emotional problem with an employee with the general aim of reducing the problem. According to him, Counseling is an act of communicating that deals with emotional problems. This act of reducing emotional disorder could be done by both the school principal and the professionally trained counselors. Pinto went further to report that nine out of every ten people suffer from a mental or emotional disorder. Such people are recognized as those who are high-strung, over sensitive, and angry with the world. Others include alcoholics and drug addicts. Many others still have temporary upsets due to certain events. For Uyi (2014), counseling is warranted when one notices an inability to cope with the environment. This inability manifests in behaviour disorder which in turn does lead to harm the individuals, the

organization and others working therein. Feelings are important component of human beings that cannot be ignored. They are facts and more so to the individual concerned. Managers desire the employees to maintain a reasonable emotional equilibrium and to channel the emotions to constructive activities.

According to the Karl (2016), counseling is the process of building relationships with individuals that empower them to accomplish mental health and wellness, education, and career goals. It is a collaborative relationship between the counselor and their client. Professional counseling can take the form of:

- Individual counseling is the most common type of counseling that focuses on the growth and mental health of an individual. Couples or marriage counseling focuses on assisting couples in overcoming conflict and working towards a stronger relationship.
- Family counseling involves the different familial dynamics and how they affect the family structure.
- Group counseling is the use of group interaction to facilitate growth.

A counsellor is likely to engage in many of these types of counseling throughout his therapeutic work.

From the above discourse, one finds out that the scholars have different definitions in respect of Counseling. However, they have a common denominator which is stabilizing emotional disorder in order to maintain good health, be productive and make a good career choice. There are six processes involved in Counseling. These processes are distinct in nature and they are discussed below.

- **Opening:** The opening process is perhaps, one of the most important parts of the interaction with your client. This provides the counsellor the chance to get to know his client and for them to get to know him. It is also where the counsellor will set the tone for the rest of the therapeutic relationship.

- **Exploring Client Understanding:** The exploration process is where the counsellor begins to understand his client. He will explore their past and evaluate their current concerns. Here, the counsellor together with his client establish goals and set expectations.
- **Understanding:** This is Important in developing a strong relationship the client, here, the counsellor demonstrate, understanding by using verbal and nonverbal cues, as well as reflections and paraphrases.
- **Intervention:** The intervention process is about choosing the appropriate counseling techniques that will encourage growth within the client.
- **Exploring Problems:** Exploration is the process of learning more about the client, and why he has come to counseling. Exploration is necessary in truly understanding a client's thoughts and feelings in relation to his pressing problem.
- **Empower to Create Own Solutions:** Empowering the client is not about providing him with all the answers. It is about empowering
  his, with counseling skills, to find his own solutions.

Concept of Conflict

Conflict is a natural phenomenon. It occurs in every organization, school inclusive. This is because school as an organization deed with human begins and where there is human interaction, there is bound to be disagreement. It is against this background that Nuhu (2016) defined conflicts as disagreement, incompatibility, opposition and diversity of opinion. On the other hand, Akpoviano (2016) defined conflict as a struggle or quarrel usually between individuals or groups on the process of competing for something. Akpoviano further stated that in most Nigerian secondary schools, conflict can occur as a result of insults, name calling, defamation of character, blackmailing, stepping into another's shoes, sarcasm, false accusation, withdrawal of love and support, withdrawal of salaries, fringe benefits and incentives, sudden transfer, suspension, termination of appointment and even killing.

Conflict may emerge from the allocation of scarce resources for production purposes. Conflict is perceived as inevitable, and occur when there are disagreements on the formula for allocation of resources for production, (Karl, 2018). Questions on alternative allocations, prioritization and dysfunctional polices can bring conflict in the process of decision-making.

According to Awofes (2008), Conflict is a part of organization life and may occur within the individual, between individual and between the individual and the group. While conflict is generally perceived as being dysfunctional, it can also be beneficial because it may cause an issue to be presented in different perspective. Conflict as the name implies has different interpretation and meaning so to say depending on the usage and the context of its usage. Grammatically, according to Udoh, (2016) "conflict means a serious disagreement, argument, a struggle between two people. Contextually, Nezera, (2017) referred to conflict as a "struggle, when workers and management have incompatible, conflicting or irreconcilable views on issues that could lead to conflict." Nezera maintained that it is unthinkable to find any society without conflict.

Furthermore, conflict is viewed by psychologists and administrative theorists as disagreement, incompatibility, opposition and diversity of opinion. Common to these terms is a situation where people antagonize one another and express different action. Mullins (1999) stated that conflict is a form of behaviour intended to obstruct the achievement of other person's goal. Thus conflict implies an action taken in order to prevent realization of an objective. It further implies that the actual performance of an individual, a group of individual or an organization is at variance with expected performance.

Batteman and Snell (1999) simply defined conflict as the opposing pressures from different sources. By this definition, conflict refers to diverse opinions, actions and attitudes emanating from different persons with intent to change. Modify or prevent and actions. Oyedji and Fasais (2009) furthered that conflict is a common phenomenon is an organization. Infact, one of the leaders most important duties are dealing with conflict. He is held responsible for failure caused by it (Cohen, 2008). Hence methods

of managing are important it should be sought so the it does not generate crises when it occurs. To Debono (2005) conflict is a clash of interests, values, actions, views or directions. According to Alfred (2007), the term conflict refers to tension within the organizational system. One may observe such tension by paying attention to possible incompatibilities among departments to incompatibilities among staffs members or employers, to complexities of the communication network and even to the organizational structure itself.

Gardiner and Simmons (2002) defined conflict as any divergence of interests, objectives or priorities between individuals, groups, organizations, or non-conformity to requirements of a task; activity or process. Duncan (1995) posited that conflict implies to do harm which may be considered an extreme case of competition. Conflict is different from competition, although competition may result in conflict. Some believe that conflict may occur without any specific reference to competition, as it could occur because of breakdown in the mechanism of decision-making. Conflict may occur when there is no perceived or actual incompatibility of goals. For instance, the principal and the teachers in a school may disagree on how to teach mathematics, or the management board of a school and the teacher may disagree on how to discipline student goal may be concordant but approaches based on the value, belief and norms help by each.

Conflict can occur in a cooperative or a competitive context. Conflict could result from haring leadership roles in the school bureaucracy, such head of department and assistant principal or haring of recourses, like money, books, and computers available for day to day use in running the school project, actions that are incompatible with other actions prevent, obstruct, interfere (with), injure or in some ways make the letter less likely or less effective. Ojelahi (2001) posited that in a social system of the teacher and the "taught" the teacher group is made the dominant class which leads him to give orders; place sanctions and enforce compliance on these under him. Therefore, the inherent social cleavage in school coupled with the alienation of students from the mechanism of control of school life makes conflict both natural and imperative.

No matter how hard one tries to define the term, one is prone to agree that in an organization such as the school, conflict situations are rite. School have homothetic and idiographic dimensional strata. These include the organizational role expectations or needs and individuals personality need dispositions. The school expects its members to work in consonants with its lay down rules and regulations. But naturally, the individual needs of the people in the school are in most times, at variance the school objectives. When this happens conflict is engendered in the system. This is so because members of the school consciously or unconsciously bring to the school their personnel needs, values, attitudes, life philosophy which they want to satisfy or propagate. The interaction effect of the individual needs and organizational demands could result in conflict situation. Akazue (2005) observed that conflict in educational institution is defined as mutual hostility in inter human relationship. According to Akazue, hostility can occur in the form of insults, naming calling, deformation of character or black mailing, stepping on another shoes, sarcasm, false accusations, withdrawal of salaries, fringe benefits, strikes, suspend transfer, suspension, terminal over pointment, demotion, marginalization, deprivation, boycott of classes, violent demonstration, detention, open violence or killing. Akazue maintains the disagreement, difference or arguments are complete promoting factors which can become conflict when hostility characterizes them.

In conclusion of concept of conflict, it is pertinent to look into the contribution of an erudite scholar Hodgkinson concerning conflict. Hodgkinson (2001) it: The central problem of administration was one of reconciling too often divergent interests: those of the individual or those of the collectivity or an organization. To make this interest coverage upon the goal of collectivity is to accomplish the call task of leadership. Stoner (1989) in Aghanchi (2004) maintained that conflicts are disagreement that occur between groups and within groups. He emphasized that conflict emerge not only between groups but also within them. This show that in every organization, the interaction of human elements and possible deviations in opinions and views, interest and inclination

usually to minor and major troubles that characterize group dynamics. In an important work entitled “Paradox of group life”. Smith (2007) proposed a new way to understand such intergroup (within group) conflict. According to Smith, most people think that conflict most be managed and resolved, but conflict are essential to the very concept to group life. Smith explained that conflict paradox can be identified into 7 aspects; identify, disclosure, truest, individuality, authority regression and creativity.

The paradox of identity is that groups must unite people with different skills and outlooks precisely because they are different, why those people usually feel that the group diminishes her identity. The paradox of the closure is that although the members of the group must disclose what is on their minds if the group is to succeed, fear of rejection makes them disclose only tendencies within the society itself. Since organizations are made up of human beings, males and females the starting point is that in any human setup, made up of more than one individual, there is bond to be conflict largely because the individual cannot possibly reach agreements on all issues all the time.

Adewume (1992) stated that the nature of the society itself is made of experienced and less experienced individuals with antagonistic classes and interest groups is a major source. It is in view of this that conflict is said to be endemic in society because of the deep rooted difference of interest that drive groups and within this dispensation consensus is only temporal. Worsely (2000) maintained that in any real society, there will be conflict between institution rules and people and as such it can be said that no raised society could be perfectly integrated entirely free from conflict. Within this context, the problem is not necessarily from arising from which is almost impossible but to manage conflict when they arise such that more damaging effects can be nipped in the bud.

Phases Conflict

A conflict has five phases.

1. Prelude to conflict

It involves all the factors which possibly arise a conflict among individuals. Lack of coordination, differences in interests, dissimilarity in cultural, religion, educational background all are instrument in arising conflict.

2. Triggering Event

No conflict can arise on its own. There has to be an event which triggers the conflict. Jenny and Ali never got along very well with each other. They were from different cultural backgrounds, a very strong factor for possibility of a conflict. Ali was in the mid of a presentation when Jenny stood up and criticized him for the lack of relevant content in his presentation, thus triggering the conflict between them.

3. Initiation phase

Initiation phase is actually the phase when the conflict has already begun heated arguments, abuses, verbal disagreements are all warning alarms which indicate that the fight is already on.

4. Differentiation phase

It is the phase when the individuals voice out their differences against each other. The reasons for the conflict are raised in the differentiation phase.

5. Resolution phase

A conflict leads to nowhere. Individuals must try to compromise to some extent and resolve the conflict soon. The resolution phase explores the various options to resolve the conflict. Conflicts can be

of many types like verbal conflict, religious conflict, emotional conflict, social conflict, personal conflict, organizational conflict, community conflict and so on.

Conflict and fighting with each other never lead to a conclusion. If you are not on the same line as the other individual, never fight instead try your level best to sort out your differences. Discussion is always a better and wiser way to adopt rather than conflicts.

Classification Conflict

Leadership is very central in all human organizations such as the family, government, church, schools and indeed, anywhere people work in groups. There must be somebody who directs the activities of the groups. In order words, leadership can become confused in attempting to deal with an organization unless the leader understands and can interpret nature of the conflict he/she is dealing with, leader must therefore examine type of conflict and their associated influence on educational organization. Bernard (2007) asserted that human behaviour is controlled by private moral codes. These codes are derived from different basis including a social environment base contained in political, economic and religious groups; a physical environment base contained in biological properties and phylogenetic history grounds; a technological practices base; an educational base and training base. Bernard noted that these moral codes are absorbed positively from the environment or negatively by lack of concrete experience. He explains that some individual codes are superior and command stronger validity or power; and that individuals experience conflict as a direct result of the specific codes of behaviour pulling them in different directions.

Oku, Emenalo and Okeke (2008) identified the following types of conflict. A person conforms to two or more contradictory sets of roles at the same time, conformity to one role would prevent the executor of another.

Personality conflict: A person who holds principles (e.g. democratic principle) finds himself operating another principle (e.g Autocratic principle).

Role-personality: A person's role expectation is at variance with his need disposition. For example, a principal is expected to use school equipments to improve the lots of the school but if he sells them in order to enrich himself, he will be experiencing role-personality conflict.

Cognitive Conflict: These centers on differences in perspective or judgments about issues. Legitimate differences of opinion can be expressed, better ideas can be developed and problems can be solved when this type of conflict occurs. It is constructive in nature.

Affective conflict: This has to do with person's emotion and it is directed against people. It can lead to anger, bitterness, goal displacement and lower quality decision. It is destructive in nature. Obis (2003) reported that conflict could be organized or unorganized.

Organized conflict: This is a group activity. It has for example the blessing of the entire group to sure for conflict. If a union supports a conflict, it is an organized conflict.

Unorganized conflict: This is the type of conflict in which individuals respond to conflict in their individual way or the way they think would resolve or aggravate the conflict. This type of conflict may not have the blessing of the entire group or union. Beek and Betz (2005) examining organizational conflict in schools identified two types of conflict:

- Intra-stratum conflict between groups or individuals of equal power.
- Inter-stratum conflict between groups or individuals of unequal power.

School conflicts are inter-stratum and the conflicting parties have power based within the organization.

Apart from the "lust for the fight idea" developed by Coser, theorists have created two generic typologies:

Those which occur between competing organizations, between organizational members.

Those which occur between competing organizations.

Sources of conflict

According to Torrington and Chapman (1979) there are sources of conflict endemic in certain situation". These authorities explained that in the work and employment situation comprising of experienced and less experienced staff, some major sources of conflict include: The aggressive impulse, divergence of interest, clash of values, competitiveness and organizational trading. These sources were briefly explained by the authors, thus:

The aggressive impulse: Torrington and Chapan in Akoanyi (2007) explained that those who studied the evolution of Homo sapiens (ie human being) demonstrated the innate aggressiveness of man. They maintained that even though the process of civilization tends to have constrained it somehow, there is still a natural impulse for man to behave aggressively to some degree at some time. One of the opportunities for expression of the aggressive impulse is within the employing organization, which is a splendid arena for the express of combat.

Divergence of interest: In this Aspect, ti is believed that probably the main source of industrial relations conflict is divergence of interests between those who are classified as managers and those who are seen as non-managers. One group is seeking principally such things as efficiency, economy, productivity and the obedience of others to its own authority. The members of the other group are interested in these things, but are more interested in features like high pay, freedom of action, independence of supervisor scope for the individual and leisure. To some extent this is invariably conflict.

Clash of values: According to Torrington and Champan in Amajiogu (2006) "more fundamental is the possible clash of values usually about how people should behave". These may be variation of allegiance to the position of different political parties on question like what is production for. Or difference of social class attitude to what constitutes courtesy. Most frequently the class is about the

issue of managerial prerogative. Managers are likely to believe and proclaim that management is their inalienable right so that those who question the way theirs is done are ignorant. Non-managers may regard management as a job that should be done properly by people who are responsive to questioning and criticism.

Competitiveness: in this direction Torrington and his colleague maintained that one of the most likely sources is the urge to complete for a share of limited resources. Much of the drive behind differential pay claims is that of competing with other groups at a similar level, but there may also be competition for finance, materials, security survival, power recognition or status.

Concept of conflict management strategy

Management is an important concept in any organization. The absence of any form of management in organization leads to chaos. Nothing positive can be realized in a chaotic environment. This explains the relevance of management especially in school system. For the goals and objectives to be realized in schools, there must be effective management in place. In this case, Dunga, (2014) noted that management involves two categories of practices or functions, namely; managerial and operative. Basic managerial functions include planning, organizing, motivating and controlling. These are common to all managers including secondary school principals. The planning function of a secondary school principal pertains to the steps taken in determining a course of action for education delivery. This involves developing a programme and specifying what and how operative practices are to be performed. After plans have been developed, the secondary school principal must organize how to carry them out. This practice or function, therefore, calls for grouping of activities, assignment of different groups of activities to different individuals, delegation of authority to carry them out and provision for coordination of authority relationships horizontally and vertically in the organization structure.

Management must inculcate in the workers a keen appreciation of the organizational policies. He must guide them towards improved performance and motivate them to work with zeal

and confidence. Control involves measuring performance, correcting negative deviations and assuring the accomplishment of plans. Through direct observation, direct supervision, as well as report, records and audit, management assures itself that its practices are being carried out in accordance with the plans.

Samuelson (2013) listed management strategies or functions as;

1. recruitments
2. selection
3. training and development
4. job evaluation
5. salaries/wages administration
6. formulation of manpower policies
7. provision of data for planning and decision making;
8. co-ordination of performance appraisals
9. promotion of relations
10. research, health and safety administration,
11. administration of discipline.

For schools to effective in education n deliver, strategies for conflict management have to be put in place. This is because no meaningful teaching and learning can occur in an environment characterized with conflict. In this regard, both the school administrators and the teachers are to work harmoniously, avoiding areas of conflict and/or reducing conflict to the barest minimum. This, therefore, explains the need for strategies for conflict management in secondary schools in Enugu State. It is on this premise that King (2016) defined conflict management as a process of combing and utilizing of or allocating organization's output (men material and money) by planning, organizing, directing and controlling for the purpose of maintaining peace and tranquility in the organization. Conflict management according to Nuhu (2016) is the process by which managers create, direct, maintain and operate organizations through coordinated, cooperative human efforts such that squabbles and disagreement are eradicated or at worst, brought under control.

Principals overtime have adopted various strategies for managing conflicts. Strategies according to Smith (2016) refer to techniques, approaches, methods and interventions adopted to solve problems. King (2016) went further to add that a strategy is a plan of action intended to accomplish a specific goal. Research evidences such as King (2016), Lawal (2017) and Nezera (2017) have recommended the use of counseling interventions as an effective strategy for managing conflict in secondary schools. According to King (2016) counseling is a psychological process through which the client is given all the assistance he needs to develop an improved ability of solving personal adjustment problems as well as the ability to achieve positive growth and the actualization of his personality. Lawal (2017) added that counseling involves giving advice, especially professional advice or recommendation to a client.

In specific term, Nezera (2017) recommended six counseling strategies that could be used to manage conflicts in secondary schools effectively. These include;

1. *Allow the Client to Explore (ACE Strategy)*
2. *Using Silences in the Relationship (USR Strategy)*
3. *Paraphrasing Strategy*
4. *Using REBT Challenges (URC Strategy)*
5. *Using Positive Verbal Encouragements (UPE Strategy) and*
6. *Directive Counseling (DC Strategy)*

These six counseling strategies for managing school conflict shall be adopted for this study.

Concept of Principalship

Ikechi (2011) averred that the concept of principalship can best be understood with reference to who a teacher is. Ikechi argued that since principals are made from among high ranking teachers, the definition of the term principal must stem from the definition of a teacher. In discussing the concept of principalship in this work, therefore, the definition of a teacher is of utmost important. Uyi (2014) defined a teacher as one who is involved in the guidance of pupils through planned activities to enable them acquire valuable skills while reflecting on their experiences. Davidson (2011),

defined a teacher as a person who helps someone to learn. Udoh (2012), posited that a teacher is one actively involved in a systematic, rational and organized process of transmitting knowledge and skills in accordance with professional ethics and principles. As Ikechi (2011) stated, it is from high ranking teachers in secondary schools that principals are selected. Ikechi then defined a principal as a teacher promoted to a management position and given the task of being in charge of a secondary school.

On the other hand Udoh (2012) held that the principal is the administrative head of a secondary school. The principal leads the management team of a secondary school. The principal should be regarded as an administrator and by extension the school administrator can be regarded as a leader. Udoh explained that this is because the administrator (principal) performs certain functions that make the school to be effective. Such functions involve planning, organizing, directing and controlling. Amusan (2012), hinted that principalship involves identification of the vision, mission, strategies and objectives of secondary school well in advance and provision of means of accomplishing them. The principal undertakes short, medium and long term planning as a foundation range planning. Amusan went further to state that principalship involves the control of human and materials resources of the secondary school. He contended that since the principals sit at the helm of affairs or the top of the management or administrative ladder of the secondary school, principal should be seen as a leader, the executive head, supervisor, manager, school climate developer, change facilitator and the Chief Servant. Evidently, one of the most frequently discussed aspects of principalship is leadership. Modo (2013), defined a leader as a person who shows the way and influences someone else to think in a particular way. A leader therefore is expected to know the way, show the way, go the way and influence other people to do same. Modo further defined principalship as the mobilization of group efforts towards the achievement of stated goals in a secondary school. Principalship, thus, is the capacity to coordinate many and often conflicting social energies in the secondary school, so adroitly that they shall operate as a unit.

Gutua (2015), collaborated this with the definition of principalship as effective coordination of resources and people's efforts for the achievement of the goals of secondary education. Shehu (2013) opined that principalship entails ability to manage or economize available scarce resources through careful control, regulation or supervision of all activities in the secondary school. Principals' activities include; overseeing and monitoring enrolment of students, attraction of best staff, conducting teaching, learning and research as well as graduating secondary school students in an effective and efficient manner. In the course of carrying out his duties, a principal may wish to lead by giving information, suggesting alternative courses of actions and trying to stimulate self-direction in the people he leads. In this case, the principal is said to adopt a participatory leadership technique or a democratic leadership style.

Karl (2016) recommended that any principalship who will succeed must pay more attention to personnel management with particular reference to conflict management. This is because personnel management is all about human resource development. Human resource no doubt, is the most essential of all the resources for development in any organization, most especially an organization such as secondary school whose raw materials are humans. Sincerely, when human resource is put in place in any organization, all other resources can be substantially harnessed. Karl further asserted that the major goal of secondary school is human development. When a secondary school staff or personnel are developed, the ultimate beneficiary is the student in terms of knowledge acquisition. This is only feasible in an atmosphere that is devoid of conflict. Since conflict is inevitable, principals should devise strategies on how to manage conflict in order to establish enabling environment for teaching and learning.

From the foregoing, the advice of Bordin (2016) is very useful to all secondary school principals. Bordin submitted that principals should not restrict themselves to overseeing or inspecting and monitoring workloads, equipments, finances, materials, people, time, etc. rather principal should have a wider picture of the school. As an administrator or a manager, the principal should be visionary.

Bordin averred that a principal's vision for his school should have three components: hindsight, insight and foresight. Through the hindsight, the principal sees the past, through the insight, he sees the present and through the foresight he sees the future of the school. Summarily, principal is the catalyst that propels education delivery. The disposition of the principal towards education delivery will dictate the nature of education outcomes that will emerge. Top on this disposition list is his ability to manage conflict in the school and establish environment that will enhance effective teaching and learning. It is only conducive teaching and learning environment that will lead to positive education delivery and outcomes.

Concept of Secondary Education

Secondary education is the education children receive after the Basic Education and before the tertiary stage. Secondary education spans from Upper Basic Education (Junior secondary to Senior secondary school). The broad goals of secondary education are to prepare the child for useful living within the society and for higher education. Consequently, the objectives of secondary education are;

a) to provide trained manpower in the applied sciences, technology and commerce at sub-professional grades
b) foster national unity with an emphasis on the common ties that unite us in our diversity
c) raise a generation of people who can think for themselves; respect the views and feelings of others, respect the dignity of labor
d) appreciate those values specified under broad national goals and
e) live as good citizens and provides technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development, (Federal Republic of Nigeria, 2013:44).

Summarily, the place of secondary education in national development cannot be overemphasized. Mostly because education in general and secondary education in particular fosters the worth

and development of the recipients for each recipients' sake and for the general development of society. The success of secondary education should, therefore, be of concern to all and sundry. Lawal (2017) posited that one of the challenges of secondary education in Nigeria is the ability of the principals to manage effectively all conflicts arising in the system.

Effective conflict management in secondary school is a prerequisite to effective education delivery and outcomes. Its importance cannot be overemphasized. This is because when teacher is involved in conflict, this lead to function and this affects adversely teachers. Productivity and by extension students' performance in both internal and external examination.

Counseling Interventions

Counseling interventions have been defined in professional literature as a unique interrelationship between a client and a counselor, which aims to create a change and a growth in three main areas; personal development, social adjustment and professional development, (Smith, 2016). During the counseling process, the counselor has the responsibility to contribute to the process of change, concerning to his or her client's personal development, (Bordin, 2016). The current essay will demonstrate several significant elements that are associated with counseling intervention as a psychological process, clarifying important aspects and strategies that contribute to the effectiveness of the process.

Concept of Urban and Rural Schools

Location in the context of this study will be categorized into two viz; urban and rural. The emergency of urban congestions has worsened things and created more unmanageable social problems. The problems of urbanization are many and they constitute a big threat to teaching and learning in Nigerian schools. This is because learning must take place in a very conducive environment, (King, 2016). Undoubtedly, urbanization and rural development still pose great challenges to the government of developing countries such as Nigeria. In the urban areas, barely all the basic infrastructures are inadequate in supply, hence, the struggle for and consequent over

stretching of the available few. Therefore, the school system is characterized by over-crowded classrooms, insufficient and obsolete equipment, absenteeism occasioned by the use of school children for street trading even during the school hours, truancy on the part of the teachers as they hassle to survive the high cost of living, etc. in this situation, no doubt, it is difficult to raise children and very difficult to teach children. Hence, the need for adoption of Counseling strategies that will help in the up-bringing and training of children (such as secondary school children) who find themselves in urban locations.

On the other hand, the situation in the rural areas is not in any way better. Although the rural locations may never be known for over-population, they have definitely suffered neglect and abandonment, (Pinto, 2017). Hence, schools in the rural areas are marked by dilapidated buildings, where they even exist at all and lack of necessary equipments to enhance teaching and learning. Many rural schools have been deserted by teachers who usually seek transfers to urban areas. All these largely tell on the rural learners who are the most vulnerable because it is difficult to raise children and very difficult to teach children in rural areas with the above characteristics. Hence, the need for adoption of Counseling strategies that will help in the up-bringing and training of children (such as secondary school children) who find themselves in rural locations. Thus, a study of this nature is important as it seeks to investigate whether location can influence counseling strategies adopted for conflict management. This gap is one of the challenges intended to be addressed by this study.

Concept of Gender

Gender is an important variable in current researches in the field or education. In most states, female gender has imposing population in teaching profession. In Enugu state, many school have female principals. This explains why gender is a factors in this study. Akan (2014) asserted that gender refers to the socially, culturally constructed characteristics and roles which are ascribed to males and females in any society. Gender is a major factor that influences the students' behavior including career choice and

subject interest of the student. According to Udida (2015), gender or sex refers to those characteristics of males and females which are biologically determined such as possession of the male and female reproductive genital organs. Udida further gave a broad analytical concept which draws out female role/responsibilities in relation to those of males describing the males attribute as bold, aggressive, tackful economical use of words, while females are fearful, timid, gentle, dull, submissive and talkative. Modo (2013) alleged that in schools, males are more likely to take difficult subjects areas like sciences, while the females take to careers that will not conflict with marriage chances, marriage responsibilities and motherhood and this may influence their study behavior.

Evidently, teachers also, encourage gender stereotype by giving different treatment to males and females. Teachers go further to give different career guidance to males and females. The society frowns at seeing a man cooking or a female climbing a tree. Nigeria, since she gained her independence had never produced a female President. To correct this abnormally, it is expected that the leading experiences offered to the children in schools should not discriminate against males and females. Gender discrimination cut across almost every sphere of lives of citizens of developing nations such as Nigeria. It is therefore not a surprise to hear secondary school teachers arguing that Counseling strategies are gender sensitive and gender based. With this in mind, many secondary school teachers seem to believe that most Counseling strategy are characteristics of female while others are characteristics of male. It is against this background that this study intends to determine the extent to which both male and female principals adopt Counseling strategies for conflict management in secondary school in Enugu state.

Theoretical studies

This section of the study is focused on the variables of the study that gave rise to the various research questions.

Allowing the Client to Explore (ACE) Strategy

Allowing the client to explore (ACE) strategy is aimed at providing the clients with the ability to explore his or her inner

world. Abiodun (2016) postulated that ACE strategy is achieved in varied strategies and modes of interaction that are targeted at increasing the level of awareness of the clients. Lankey (2017) in a similar proposition held that ACE strategy is based on activities aimed at enhancing the clients' level of motivation to change. Lankey further posited that the client can be helped through ACE to recognize social and mental experiences when he or she is allowed to explore his or her hidden world and new aspect in his or her behaviour.

The ACE process avails the client an insight into the situation. The ACE strategy originated from a wide range of attitudes and approaches based on the psychoanalytic theory, the Gestalt theory, Rogers' theory and the behaviorism, (Lee and Phyla, 2017). Lee and Phyla posited that the history of psychology and counseling cannot be complete without mention of the ACE strategy. The ACE strategy, according to Lee and Phyla (2017) is veritable in conflict situations. Lee and Phyla argued that ACE strategy helps the clients to connect with vital healthy cores. This leads to changing feelings, thoughts and behaviours positively in an individual way. Consequently, the clients can progress in the healing process when conflict-inflicted wounds are healed. The clients can operate in their full human potentials thus, moving the school or the organization forward. Lee and Phyla therefore recommended that school Administrators should facilitate clients to progress in exploration process.

Abiodun (2016) outlined some indices of ACE strategy to include; allowing client to examine merits and demerits of their behaviour, allowing clients to investigate consequences of risky behaviours and acknowledging social experiences of clients. Lankey (2017) added other indices such as; Taking into consideration the mental experiences of clients, facilitating clients' changing behaviour in an individual way, helping clients to change their feelings individually and helping clients to see the need to change their thoughts themselves. Rogers (1957) cited in Duke (2018) outlined some other indices of the ACE strategy such as Being genuinely engaged in the therapeutic relationship, having unconditional positive regard for the client, feeling empathy for the

clients and clearly communicating desirable attitudes. The others include; Being compassionate with the client, sitting together while the client experiences strong emotions, being supportive to client and giving positive feedback to client. The above sixteen indices listed by Abiodun, lankey and Rogers constitute the questionnaire items that shall be used to elicit information on the research question that addresses extent of adoption of the ACE strategy in this study.

Using Silences in the Relationship (USR) Strategy

Silences are unverbal reactions. Silences can be used to express empathy and understanding as well as confusion and misunderstanding. Akan (2014) averred that silence can be a form of avoidance in a relationship when one has an issue with a partner and is unable or unwilling to express it. Akan posited that people who are conflict-averse may resort to silence as a way of avoiding the possibility of an argument.

Monsour (2012) noted that psychotherapy clients frequently comment on the various ways in which they experience silent moments in a relationship. Monsour observed that, sadly, silence is qualified as awkward. Sadly too, silence is usually associated with unhappy tales of discomfort, unease and worry.

Monsour further hinted that it is quite unfortunate that silence is usually interpreted as a sign of trouble in an ongoing relationship or a sign of social anxiety or social ineptitude in more casual relationship. Monsour stated unequivocally that this interpretation might not always be accurate. Monsour maintained that those who see silence as awkward are people who believe that every moment needs to be filled with words. To such people, they get angry and feel deprived because silence suggests to them that something must be the matter rightly or wrongly. Monsour affirmed that certainly, silence, sometimes, might be an indicator that a relationship is in trouble, however, this should not be prematurely concluded.

Tsui (2016) observed that people prematurely conclude silence to be negative when there is silence without obvious explanation. Tsui submitted that silence in a chronically troubled relationship is likely to be very different from silence in a strong,

secure relationship where the silence might be a form of quiet intimacy. Silence may be useful when it stops or inhibits the opportunity to air a grievance or complaint. When silence is used to suppress a grievance or a complaint, there is need to address the issue withheld. One should not simply assume that all is well. Else the positive nature of silence may bring about a negative result. According to Erner (2018), in an intimate relationship no party betrays the other, rather, each party expresses strength and vulnerability as well as weakness and competence in a balanced way.

Bordin (2016) noted that using silence in a relationship allows both the counsellor and the client to get closer, to share feelings, share thought and emotions. On the other hand, using silence in a relationship help both the counsellor and the client to be aware of distances and gaps that may exist in the process. Bordin insisted that using silence also reassures the client that he or she is being listened to. It further assures the client that his or her shared feelings and thoughts are being carefully attended to. Bordin (2016) suggested some indices of USR strategy as follows; Applying intellectual perception of the thought of your clients, attempting to read the feelings of clients through nonverbal reactions and considering the state of mind of clients even when they are silent.

Tsui (2016) added the following indices; understanding what it means to be in the client's conditions, reading client's unexpressed emotions, acknowledging gaps that may occur in trying to get close to clients and avoiding being judgmental when clients maintain silence. Erner (2018) also added the following as indices of USR strategy; trying to remain objective about what is actually occurring until you are able to learn more, trying to remain neutral about what is actually occurring until you are able to learn more, not allowing your fears to guide you, developing a greater tolerance for the silences when they occur, avoiding the tendency to misinterpret the meaning of silence, assuring the client that his/her shared feeling are being considered and attended to. The above listed fourteen indices of USR by Bordin, Tsui and Erner shall constitute items of questionnaire addressing the research question

formulated to determine the extent of adoption of USR strategy by the principals under study.

Paraphrasing Strategy

Paraphrasing according to Ikechi (2016) occurs when the counsellor state what the client has just said, using fewer words but not changing the meaning of what the client said. Paraphrasing usually entails re-casting the clients' statement (complaints) in simpler words but retaining the original meaning. Ikechi re-affirms that counselors utilize paraphrasing when they attempt to feedback the essence of what the client has just said. When properly utilized, paraphrasing can contribute greatly in managing conflicts effectively, (Monsour, 2012). Paraphrasing encourages additional thoughts, new expressions and aids in understanding both the immediate and remote causes of conflict, (Duke, 2018). Duke held that using paraphrasing during Counseling also assists the counsellor to clarify and brighten the clients' expressions and countenance.

Modo (2013) gave a list of possible indices of paraphrasing as; letting the clients know that you are listening and understanding what they are saying, clarifying confusing contents, highlighting issues by stating them more concisely and checking out the accuracy of your perceptions as the counsellor. Omotere (2014) suggested possible ways a counsellor could paraphrase to include; you can as a counsellor use the word inconsistent to describe a person who a client claims not to know very well because the person can be friendly and in a short while turn to be totally cold. When a client complains of something new or too many tasks going on at the same time, the counsellor through paraphrasing can conclude that there is a lot of activities for the clients to choose from.

Omotere stated that the intention of paraphrasing is often to allow the client to continue speaking without interruption while communicating to the client that you are listening. Paraphrasing hence, assures the clients that he or she is being understood. Duke (2018) recommended that the paraphrase should neither be too short nor too long. Duke advised that counselors should practice paraphrases of different lengths, variations of content or emphasis

of wording so that he (counsellor) is able to find what works best for the purpose intended. Duke further warned that over reliance on paraphrasing to the exclusion of reflection often indicates a discomfort on the part of the counsellor to encourage the client to be emotionally expressive. When applied properly, paraphrasing can encourage the client to explore and examine his or her feelings and thoughts.

In the observations of Erner (2018), paraphrasing can brighten a significant hidden aspect of the case being handled. It can also aid the development of useful insight into the case. Omotere (2014) added the following to the list of indices of paraphrasing; assisting clients to tackle conflict by restatement of a text in different words, encouraging additional thoughts in clients by clarifying issues, Assisting clients to tackle conflict by restatement of a text in different words, Eliciting new expressions from clients through restatement of complex ideas in simpler forms, Brightening the countenance of clients through clarifications, using simpler and lower terminologies, giving people involved in conflict long period to explain themselves and summarize, interpreting the clients' narration of the conflict matter, encouraging the clients to proffer solution to the conflict problem, encouraging the clients to map out strategies to solving the problem, involving clients in adopting the best option for resolving conflicts and putting yourselves in clients' shoes in order to understand and paraphrase their narration of the conflict situation.

These indices outlined by modo (2013) and Omotere (2014) shall form items of the section of the questionnaire that shall address extent of adoption of paraphrasing strategy by the subjects of this study.

Using REBT Challenges (URC) Strategy

Rational Emotive Behavior Therapy (REBT) strategy is a therapy that relies on honesty from the therapist to help a person recognize and challenge irrational thoughts and act differently as a result.

Uchendu (2013) held that REBT is a from of therapy that involves facing the rationality of some of your negative feelings.

Evidently, all humans doubt and fear, but most of the doubt and fears are just plain irrational and contradictory. Uchendu cited example of, those who fear to die on a plane, but are perfectly okay with driving in a car and described them as being irrational and contradictory. Uchendu's view was supported by Gatua (2015) who argued that commercial air planes are the safest form of travel, while travelers have a much higher chance of dying while driving around their home town. Gatua qualified all thoughts that are bringing a person down as irrational. According to Gatua REBT focuses on thoughts or beliefs that can end up being self-destructive and it tries to replace those thoughts with something more positive and rational. Nuhu (2016) averred that Humans can be creatures of irrationality. According to Nuhu even the most skeptical of us can fall into irrational beliefs about ourselves and the world around us.

Rational Emotive Behavior Therapy (REBT) according to Nuhu (2016) is the creation of Albert Ellis, a psychologist in the mid-1950s. Nuhu narrated that Ellis had a fear of talking to the opposite sex, and he tried to conquer this fear by making himself talk to as many women as possible. This simple challenge evolved into what is known as REBT today. Ellis became a psychologist, and he did not like the ways he held to treat his patients. While he saw his patients changing their behaviour. To him, they were aware they had a problem but were still ignoring any solutions. So, Ellis developed REBT, a form of psychotherapy based on how people view the world, and the irrational beliefs they may have. Karl (2016) gave REBT principle as the ABC model. The ABC model is based on Ellis's interpretation of how people see the world. He believed that people's understanding of certain events is what causes mental distress. The ABC model was designed to explain it. A stands for activating event, B stands for belief and C stands for consequence. Karl used the case of fear of Plane crash to explain the ABC model as follows; Plane crashes rarely happen, but when they do, they're constantly covered in the media, making the problem seem worse than it is. This can be the activating event.

Irrational beliefs come in when a person sees a plane crash and there is the tendency to believe that every plane is at high risk

of crashing. This may make someone think that the next plane you he rides on is just one slip-up away from crashing in a fiery blaze. Consequences come in when one feels that planes are dangerous, he/she avoids them whenever possible, and when they have to ride on one, they may be in a constant panic. Karl further described the consequence as emotional response not minding how irrational the beliefs are. Duke (2018) observed that while other therapists tend to help client through gentle talk, Ellis's approach was to be brutally honest. The therapist may be blunt about how irrational the client's beliefs are and use logic to de bunk them. If you want someone to be brutally honest and explain why you're wrong, REBT is right for you. Obviously, you're not going to chance your irrational belief just because someone gives you a stern talking to. Instead, you have to be the one who changes your beliefs and takes down any irrational thoughts before they can bloom into something worse, (Duke, 2018).

REBT according to Kitz (2018) is based on several major psychological approaches such as the Cognitive Behavior Change theory, wherein clients in therapeutic treatments are required to monitor their feelings, thinking and interacting both with themselves and with others. Hence, through REBT, clients are encouraged to make changes in the "scripted nature" of their behavior. According to Kitz the Rational Emotive Behavior Therapy (REBT) posits that the client's disturbing emotions are based on wrong or false thinking and beliefs. By using REBT challenges during the treatment process such as self-talk and self-statements, the client can challenge his or her wrong beliefs and assumptions through self-defeating internal dialogue. REBT strategies provide clients the tools and the ability to replace exaggerated beliefs and thoughts with encouraging adaptive thinking, emphasizing the medication of self-destructive concepts and feelings and the elimination of irrational or negative thoughts. These attributes of using REBT challenges (URC) strategy shall form items of section of the questionnaire which is directed to determining the extent of adoption of URC strategy by secondary school principals in this study.

Using Positive Verbal Encouragements (UPE) Strategy

Positive verbal encouragement is a strategy commonly used to encourage clients perform to their maximum potentials. EL Amin (2012) posited that Positive verbal encouragement helps the administrators to show clients that they are paying attention to what they are saying. According to El Amin nothing can turn off or discourage clients like giving them the impression that you do not care or understand their plights. Smith (2016) submitted that the major function of a counsellor, administrator or a leader is to acknowledge clients, their story and their feelings, and let clients know that you are listening, without interrupting the flow of their speech. Smith suggested that Positive verbal encouragement can be utilized through two techniques. These techniques are repeating (or echoing) and maintenance of constant eye contact.

Repeating (or echoing) according to Smith entails resounding the last few words of client's sentences. Nezera (2017) reaffirmed that repeating (or echoing) client's statements when they pause can **encourage** them to keep talking. Echoing the client's own words not only shows that you are listening and understanding them, but also enables them to hear what they have just said. This can help them refocus and make sure they are communicating what they intend. Duke (2018) held that Repetition can also be a useful technique to **reinforce information** when explaining a diagnosis to a client, and planning next steps in treatment or management. In this case, the counsellor or administrator may repeat their own words to emphasize important points, or may echo the client's words to confirm understanding. However, Duke warrened that this strategy should be used in moderation. This is because frequent echoing may be irritating, as clients may think you are parroting or mocking them. Duke further gave a remedy to this challenge by asserting that one way to avoid the impression that you are parroting is to repeat the key ideas or essence of what you heard in your own words.

The second technique postulated by Smith (2016) is maintenance of constant eye contact. According to Smith maintenance of constant eye contact assures clients that you are attentive and you care for them. On the other hand, when a counselor or administrator does not maintain eye contact with the client, the

client may feel rejected and abandoned, (Kitz, 2018). Kitz further opined that Counselors' attitudes and reaction can assist their clients to make a significant change in the thoughts as well as behavior. According to Nezera (2016) using positive verbal encouragements such as "yes" and "ok" during the counseling process can convince the client that the counsellor believes in his or her ability to succeed in handling with his or her current condition. This will consequently make the client believe that he will progressing in the rehabilitation process. Using positive verbal encouragement strategy can also create a positive environment, in which the client trusts confidentially his or her counsellor's supportive expressions and behavior.

In addition to the aforementioned characteristics of Using positive verbal encouragement (UPE) strategy, Nezera (2017) enumerated other indices such as; assuring clients that you believe in their ability to succeed in handling their current condition, creating a positive environment in which clients trusts confidently your supportive expressions and behaviour, adopting strategies that boost clients self-confidence, amplifying clients abilities, avoiding overemphasis of clients incompetence's, discouraging clients from magnifying their failures and convincing clients that failures provide useful lessons for future successes. These characteristics and indices shall form items of the questionnaire for the cluster addressing extent of adoption of UPE strategy by principals in this study.

Directive Counseling (DC) Strategy

Directive Counseling is an approach to counseling and psychotherapy in which the therapeutic process is directed along lines considered relevant by the counselor or therapist, (Awofes, 2016). Okeke (2018) added that Directive counseling is based on the assumption that the professional training and experience of the counselor or therapist equip him or her to manage the therapeutic process and to guide the client's behavior. Directive Counseling is also called **directive therapy**. Udoh (2012) described directive Counseling as any form of psychotherapy in which the therapist assumes an active, directive role. According to Udoh in direct Counseling the **therapist** may express opinions, offer

interpretations, make suggestions and recommendations, give advice about the client's actions and decisions, issue injunctions and prohibitions, or urge the client to take a particular action, such as facing an anxiety-provoking situation directly.

In direct Counseling, Kitz (2018) hinted that the counsellor plays an active role as it is regarded as a means of helping people learn how to solve their own problems. This type of Counseling is otherwise known as counsellor-centred Counseling. Because in this Counseling the counsellor does everything himself i.e. analysis, synthesis, diagnosis, prognosis, prescription and follow-up. Other features of direct Counseling as given by Duke (2018) include; focusing attention upon a particular problem during the Counseling session, during the interview the counsellor plays a more active role than the client, the client makes the decision, but the counsellor does all that he can to get the counselee or client makes a decision in keeping with his diagnosis and the counsellor tries to direct the thinking of the counselee or client by informing, explaining, interpreting and advising him. Awofes (2016) suggested the following steps in direct Counseling;

(i) Analysis: in this step data is collected from a variety of sources for an adequate understanding of the client.

(ii) Synthesis: This step implies organizing and summarising the data to find out the assets, liabilities, adjustments and mal-adjustments of the clients.

(iii) Diagnosis: Formulating conclusions regarding the nature and causes of the problems expressed by the clients is the major concern of this step.

(iv) Prognosis: This step implies predicting the future development of the problem of client.

(v) Counseling: This step indicates taking steps by the counsellor with the client to bring about adjustment in life.

(vi) Follow-up: This step implies helping and determining the effectiveness of the Counseling provided to the client.

According to Nyim (2019), when the personnel of any organization is properly managed through cordial interpersonal relationships, all other aspects of management can be harnessed properly. Nyim (2019) enumerated other attributes of direct Counseling as; changing clients' behaviour through improved patterns of relationship, treating client's psychological problems through interpersonal therapy, resolving client's conflict through improved patterns of communications, encouraging clients to acknowledge individual differences among their peers, influencing clients' perceptions of reality positively, emphasizing the significance of clients' interrelationship with their environment. These attributes and indices shall form items of the questionnaire for the cluster addressing extent of adoption of direct Counseling by principals in this study.

CHAPTER 11

Topic:

TEACHERS' PERCEPTION OF SOCIAL DEVELOPMENT SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED PERFORMANCE IN MATHEMATICS IN ENUGU STATE

Presented below are practical examples of conceptual review derived from major variables of this study.

Concept of Social Development

According to Dickson (2016) social development as a concept attempts to explain qualitative changes in the structure and framework of society that help the society to better realize aims and objectives. Development can be defined in a manner applicable to all societies' at all historical periods as an upward ascending movement featuring greater levels of energy, efficiency, quality, productivity, complexity, comprehension, creativity, mastery, enjoyment and accomplishment. Social development is a process of social change, not merely a set of policies and programs instituted for some specific results. During the last five centuries this process has picked up in speed and intensity, and during the last five decades has witnessed a marked surge in acceleration

The basic mechanism driving social change is increasing awareness leading to better organization. When society senses new and better opportunities for progress it develops new forms of organization to exploit these new openings successfully. The new forms of organization are better able to harness the available social energies and skills and resources to use the opportunities to get the intended results. Social development is governed by many factors that influence the results of developmental efforts. There must be a

motive that drives the social change and essential preconditions for that change to occur. The motive must be powerful enough to overcome obstructions that impede that change from occurring.

Social development according to Zippoh (2016) is the outer realization of latent inner potentials. The level of people's education, intensity of their aspiration and energies, quality of their attitudes and values, skills and information all affect the extent and pace of social development. These factors come into play whether it is the social development of the individual, family, community, nation, or the whole world. Social development normally proceeds from experience to comprehension. Dickson (2016) painted a psychological picture of the concept of social development. According to Dickson, as society develops over centuries, it accumulates the experience of countless pioneers. The essence of that experience becomes the formula for Process of emergence of new activities in society accomplishment and success. The fact that experience precedes knowledge can be taken to mean that social development is an unconscious process that gets carried out first, while knowledge becomes conscious later on only. Unconscious refers to activities that people carry out without knowing what the end results will be, or where their actions will lead. They carry out the acts without knowing the conditions required for success.

Dickson further averred that the gathering conscious knowledge of society matures and breaks out on the surface in the form of new ideas— espoused by pioneers who also take new initiatives to give expression to those ideas. Those initiatives may call for new strategies and new organizations, which conservative elements may resist. If the pioneer's initiatives succeed, it encourages imitation and slow propagation in the rest of the community. Later, growing success leads to society assimilating the new practice, and it becomes regularized and institutionalized. This can be viewed in three distinct phases of social preparedness, initiative of pioneers, and assimilation by the society. Furthermore, this can give raise to five major indices for ascertaining the social development status of a person, especially at the stage of adolescence. These five indices, according to Dickson (2016) include goal orientation skills, decision-making skills, sense of

belonging skills, tolerance skills and relationship skills. They are discussed below.

Goal Orientation Skills

Goal orientation according to Zico (2015) is an "individual disposition toward developing or validating one's ability in achievement settings". Previous research has examined goal orientation as a motivation variable useful for recruitment, climate and culture, performance appraisal, and selection. Studies have also used goal orientation to predict sales performance, goal setting, learning and adaptive behaviors in training, and leadership. Due to the many theoretical and practical applications of goal orientation, it is important to understand the construct and how it relates to other variables. In this entry, goal orientation will be reviewed in terms of its history, stability, dimensionality, antecedents, its relationship to goal setting and consequences, its relevance to motivation, and future directions for research.

Zico (2015) argued that students who approached college as an opportunity to acquire new skills and knowledge possessed a learning orientation while students who approached college with the goal to exclusively obtain high grades possessed a grade orientation. Zico (2015) originally believed that these two orientations were two ends of the same continuum and developed the Learning Orientation-Grade Orientation Scale to measure the continuum. At about the same time, Zico was developing a related theory that achievement motivation would lead grade school children to set high task related goals. Zico found that when some high-ability children encountered difficult tasks, they would use maladaptive strategies, leading to eventual feelings of helplessness, while others would use more productive coping strategies. Lee later conceptualized these differences as two types of achievement goals: (a) task involvement: where individuals seek to develop their competence relative to their own abilities and (b) ego involvement: where individuals seek to develop their competence relative to the abilities of others. Zico's early work set up Dweck's proposition of two types of goal orientation: learning orientation and performance orientation. Dweck postulated that children with learning goals were

believed to approach situations with the goal to master the acquisition of new skills, while children with performance goals were believed to approach situations with the goal of gaining approval from peers and teachers.

Similarly, Dickson (2016) conceptualized goal orientation as a two-dimension construct. Individuals with a learning goal orientation (sometimes referred to as mastery goal orientation or abbreviated as LGO), seek to develop their competence by acquiring new skills and mastering new situations. Dickson was not concerned about their performance relative to others, but rather with furthering their understanding of a given topic or task. Individuals with a performance goal orientation seek to demonstrate and validate the adequacy of their competence in order to receive favorable judgments and avoid negative judgments. Although Dickson's work in this area built on the foundation laid by Zico, the fundamental difference between the two scholars' works was the attribution of an individual's goal orientation.

Zico believed that the goal orientation held by an individual was a result of the possession of either an internal or external referent, while Tsui considered the adoption of a particular goal orientation to be related to the theory of intelligence held by that individual. Subsequent work by Jida (2017) and colleagues in 1982, led to a change in the conceptualization of these orientations from two ends of a continuum to two separate constructs. More recently, researchers have embraced the idea that individuals can adopt the two orientation style simultaneously: persons can be high in both learning and performance orientations, low in both learning and performance orientations, or high in one orientation and low in the other. Ultimately, individuals can entertain multiple competing goal orientations at the same time, striving to both outperform competitors and improve their own performance. This led to the conceptualization of two separate continuums, one for learning goal orientation and one for performance goal orientation. Just over a decade after Dickson conceptualized the two-factor model of goal orientation.

Gumel (2015) proposed that goal orientation is better conceptualized as a three factor model. Gumel (2015) further

divided performance goal orientation into the dimensions of avoidant performance goal orientation (APGO) and prove performance goal orientation (PPGO). APGO is centered on the goal of avoiding failure and negative judgment from others centered on lack of competence while PPGO is centered on demonstrating performance to prove competence. Learning goal orientation has also been separated into two categories learning approach orientation and learning avoid orientation.

According to Amusan (2015), APGO and PPGO have differing relationships with various outcome variables, supporting the argument that a three-factor model should be used in place of the originally conceptualized two-factor model. There has been great debate if goal orientation should be operationalized as a state or as a trait. Throughout the goal orientation literature, there are inconsistencies with regard to the conceptualization of the stability of the construct. For example, Okeke (2018) stated that in the literature, goal orientation has been conceptualized as a trait, quasi-trait, and state. They articulated that whether researchers conceptualize goal orientation as a trait or a state depends on the breadth of the inference that the researcher is attempting to support. State goal orientation refers to the goal one has in a particular situation. It is similar to trait goal orientation in that it represents one's preference in an achievement situation.

However, state goal orientation is specific to the task and context at hand. For example, Zico (2015) stated that goal orientation can be domain specific. They stated that it is possible for an individual to have a strong learning goal orientation in their academic domain but not in their work domain. Trait goal orientation refers to the consistent pattern of responses in achievement situations based on the individual's standing on goal orientation dimensions. This view of goal orientation treats the construct as a stable, individual difference characteristic. Okon (2016) toke an integrative view of the construct, stating that goal orientation is best categorized as relatively stable individual difference variable that can be influenced by situational and contextual characteristics. These authors found that when few

situational cues are present, individuals will adopt their dispositional goal orientations.

However, when dispositional goal orientations predispose individuals to adopt particular response patterns across situations, situational characteristics may cause them to adopt a different or less acute response pattern for a specific situation. Thus, trait and state goal orientation interact, so both operationalizations should be considered simultaneously. Since the realization that performance goal orientation is best split into two separate parts, researchers have conducted validation studies to demonstrate the statistical and conceptual distinction of these three dimensions to goal orientation. Conceptual and empirical work by Okon demonstrated that the factor structure of Goal Orientation does indeed lend itself to three distinct dimensions, as summarized below. An explanation of the learning approach and learning avoidance goal orientations are also included for completeness.

Dickson (2016) defines learning goal orientation as the "desire to develop the self by acquiring new skills, mastering new situations and improving one's competence". Persons with learning goal orientation seek feedback on past performance to evaluate current performance. These individuals focus on improving skills and acquiring knowledge, and are less concerned with making mistakes. Research shows that adoption of mastery goals leads to greater intrinsic motivation as opposed to performance approach or performance avoid which are associated with external motivation. One area where this can be seen as important is in the area of curriculum design. When designing learning environments for students, it is important to create opportunities that promote learning goals as opposed to performance goals. One possible implication for educators is the need to emphasize knowledge centered classroom environments that encourage "doing with understanding".

Although learning goal orientation is most commonly conceptualized as a single construct, researchers have begun to make the approach and avoidance distinction that they have previously done with the performance goal orientation. According to Tsui, learning-approach goals "entail striving to develop one's skills and abilities, advance one's learning, understand material, or

complete or master a task". This type of learning goal orientation is consistent with the way general learning goal orientation has been conceptualized previously. Alternatively, learning avoidance goals "entail striving to avoid losing one's skills and abilities (or having their development stagnate), forgetting what one has learned, misunderstanding material, or leaving a task incomplete or unmastered" Individuals are likely to pursue learning avoidance goals when they feel that their skills or abilities are deteriorating. For example, an elderly individual may notice that his/her physical and mental capacity is declining, and as a result may focus his/her goals on sustaining or improving these diminishing capacities.

Babalola (2016) defines performance prove goal orientation as the "desire to prove one's competence and to gain favorable judgments about it". The performance approach orientation represents a desire to achieve a high level of performance. Persons with performance approach orientation seek positive reinforcement and feedback. These individuals don't want to put forth a lot of effort unless they will be positively evaluated, and tend to avoid tasks where they may make mistakes and therefore be poorly evaluated. Finally, Babalola defines avoid performance as the "desire to avoid the disproving of one's competence and to avoid negative judgments about it". The performance avoid orientation represents a desire to avoid instances of low believes. Persons with performance avoid orientation focus on avoiding situations in which they will receive evaluations or risk demonstrating lack of confidence. Individuals high in fear of failure are more likely to adopt performance avoid goals.

Throughout the goal orientation literature, many studies have examined relationships between goal orientation and various antecedents. These antecedents have been identified as having varying levels of importance. In a meta-analysis by Payne and her colleagues, both need for achievement and the Big Five personality traits were identified as important antecedents of goal orientation, while cognitive ability was found to have almost no relationship with goal orientation. The following sections go into more detail about each antecedent. Payne and her colleagues did not distinguish between proximal and distal antecedents. Research has produced

mixed results when examining the relationship between cognitive ability and goal orientation. For example, Eison found that learning-oriented (learning goal orientation) students had higher levels of cognitive ability than grade-oriented (performance goal orientation) students. However, Gumel and his colleagues were unable to find any relationship between the constructs.

Although findings are mixed, "a substantial body of theory and research suggests motivational and ability traits are generally uncorrelated". In meta-analysis by Payne and her colleagues, cognitive ability and goal orientation were found to be independent constructs. Accordingly, individuals with high cognitive ability are equally likely to hold learning, prove performance, and avoid performance goal orientations. These authors also found that LGO predicted job performance above and beyond cognitive ability. Based on this research, goal orientation, rather than cognitive ability, serves as useful tool for practitioners to use to predict job performance. Need for achievement refers to the degree to which an individual "maintains high standards" and "aspires to accomplish difficult tasks". Goal orientation dimensions have been conceptualized by Ukpabi (2014) as manifestations of need for achievement and need to avoid failure competence-relevant motives.

In a meta-analysis by Zico (2015) the authors found that need for achievement was positively correlated with LGO, negatively associated with APGO, and unrelated to PPGO. Another interesting finding by these authors was that need for achievement correlated more strongly with LGO than the trait, conscientiousness. Although LGO and need for achievement were found to be strongly related, the findings demonstrate that LGO is related to, but not synonymous with need for achievement. Extensive research has been done on personality and many researchers have agreed that personality is best conceptualized as a five-factor model (the Big Five). These traits include extraversion, openness to experience, emotional stability, conscientiousness, and agreeableness.

In a study by Gumel (2015) the relationship between the Big-Five personality traits and goal orientation was examined. The authors found that goal orientation and the Big-Five personality

traits are related yet distinct constructs. They also found that personality factors combine to create people's various orientations toward learning and goals, which in turn predict the types of tasks they will engage in. In a meta-analysis by Gumel goal orientation was found to predict job performance over and above the Big-Five. Historically, goal setting theory has primarily been concerned with performance goals. Locke and Latham summarize 25 years of goal setting research by stating that as long as an individual is committed to a goal and has the ability to achieve it, specific, high (hard) goals lead to a higher level of task performance than vague or easy goals. However, the vast majority of goal setting studies have been conducted with a specific performance goal and often in laboratory settings where the task was fairly simple. It is possible that when tasks are more complex or require a long-term commitment, adopting a learning goal may lead to higher performance.

Zippoh (2014) found that the relationship between trait learning goal orientation and goal-setting was moderated by self-efficacy such that individuals high in learning goal orientation and self-efficacy set higher goal that those high in learning goal orientation but low in self-efficacy. This finding suggests that while learning goal orientation can influence goal setting, the relationship also depends on other factors such as the individual's level of self-efficacy. Akpan also found that learning and prove goal orientations facilitated challenge striving, suggesting that either orientation can effectively facilitate motivation for goal attainment.

Another factor to consider when examining the relationship between goal orientation and goal setting is the level of complexity inherent in the situation or task. In situations with more complex tasks, it appears that "do your best" goals may actually lead to higher performance than specific goals. It is possible that in complex tasks, a specific, difficult goal imposes greater cognitive demands on employees, making it difficult for them to learn the complex task due to this increased pressure. Zico (2015) found that in an air traffic controller simulation (a highly complex task), having a performance-outcome goal actually interfered with acquiring the knowledge necessary to perform the task. People performed better when they were asked to do their best. This suggests that adopting a

learning orientation may be appropriate for complex tasks or in specific settings.

However, it may be possible to set a specific, difficult learning goal. Zico found that when MBA students set specific, difficult learning goals such as mastering complex course material, they outperformed MBA students who set a performance goal for GPA. Zico claim that creating a specific, difficult learning goal in this type of situation facilitates meta-cognition which is particularly helpful in complex environments with limited guidance, such as in an MBA program. The goal orientation literature has examined the relationships among goal orientation and various proximal (e.g., self-efficacy, metacognition, & feedback seeking) and distal consequences (e.g., academic outcomes, organizational outcomes). In a meta-analysis by Zico, the goal orientation dimensions were found to be more strongly related to the self-regulatory constructs (i.e., self-efficacy, metacognition, & feedback seeking) than the performance constructs (i.e. academic and organizational performance).

They also found that APGO was the only dimension negatively related to the various outcomes. Payne and her colleagues found that the learning strategies (metacognition would likely fall into this category) and self-efficacy are the most important proximal consequences of goal orientation followed by feedback seeking, academic outcomes, and organizational outcomes. The following sections go into more detail about each consequence. Cherry (2015) defined self-efficacy as "a belief in one's ability to effectively perform and to exercise influence over events". Individuals who are high in self-efficacy set more difficult goals, exert more effort to achieve those goals, and seek to learn from the processes of pursuing those goals. In a meta-analysis by Cherry, self-efficacy was identified as a proximal outcome of goal orientation.

Similarly, Zippoh (2016) found that LGO was positively related to self-efficacy, effort, and goal setting level. Since "self efficacy functions as a primary motivational mechanism by which goal orientation influences subsequent learning processes", employees with higher levels of self-efficacy will exert more effort toward and learn more from task assignments. Metacognition is

conceptualized as an individual's knowledge and regulation over one's own cognitions. Individuals high in metacognitive awareness are skilled at monitoring their progress towards goals, identifying their strengths and weaknesses, and adjusting their learning strategies accordingly to achieve favorable outcomes. Although there have been relatively few research studies conducted on the role of metacognition in leader development outcomes, some studies have found that metacognition plays an important role in such outcomes. For example, Zippoh linked LGO and metacognitive activity and found that metacognitive activity was significantly related to knowledge acquisition, post-training performance, and self-efficacy. In a study by Lee metacognitive activity was positively related to LGO as well as cognitive, affective, and skill based learning outcomes.

Similarly, Jida (2017) found that LGO was significantly related to metacognitive activity. The National Research Council (2000) points out that it is important to remember that metacognitive skills can be taught and essential that teachers explicitly teach metacognitive skills across the curriculum in a variety of subject areas. In an organizational context, the extent to which employees actively seek feedback can positively influence job performance. Goal orientation influences how individuals evaluate the costs and benefits of feedback seeking opportunities. According to Jida, when individuals have the opportunity to seek feedback, they face a cognitive dilemma between the need for self-assessment and the need for self-enhancement. Since individuals with a learning goal orientation are interested in developing competencies, they are more likely to interpret feedback positively and thus engage in more feedback seeking behaviors to enhance performance. These individuals interpret feedback as valuable information about how to correct errors and improve future performance on a given task.

Conversely, individuals with a performance goal orientation are likely to interpret feedback as "evaluative and judgmental information about the self", and as a result are less likely to seek feedback. Consequently, individuals with high levels of learning goal orientation are more inclined to seek feedback, while individuals with high levels of prove performance goal orientation

or avoid performance goal orientation are less inclined to seek feedback (Amusan, 2015). As previously stated, goal orientation refers to individuals' behavioral tendencies in achievement oriented tasks. Therefore, it seems intuitive that goal orientation would be associated with various academic outcomes. According to Amusan, learning goal orientation is positively associated with self-regulatory behaviors such as planning and goal setting, which in turn are associated with academic performance. Thus, individuals with high levels of LGO are more likely to perform well on academic tasks than individuals with high levels of the PGO dimensions.

In addition, research has also shown that students' motivation can predict both the quality of the engagement in academic learning as well as the degree to which they seek out or avoid challenging situations. "Goal-setting is a technique that is often employed in organization as part of traditional performance appraisals and broader performance management interventions," (Jimoh, 2017). If all students are to move "through the increasing challenges and academic rigors" of school, then their motivation to learn must be identified and nurtured. Goal orientation has also been linked to organizational outcomes, specifically job performance. Jimoh found that individuals with high levels of trait and state LGO and low levels of trait APGO had better job performance. They found that PPGO was unrelated to performance. The authors also found that LGO predicted job performance above and beyond both cognitive ability and the Big Five personality characteristics.

This finding suggests that LGO is a valuable predictor of job performance and it may be in the best interest of organizations to create a climate in which learning is valued over performance. In another study by Babbola (2016) the authors found that individuals with a learning goal orientation had higher sales performance than those with performance goal orientations. This finding suggests that in order to be successful in organizational setting, individuals must have the desire to develop their skills. Research has shown that goal orientation is linked to outcomes and performance. Much of this research has been centered on outcomes in schools and job performance. When examining research on learning environments and curriculum design, one could argue that there is significant

alignment with LGO and ideal learning environments. When designing learning environments, there are some essential principles that should be in place. These principles were outlined by the National Research Council in their 2000 report entitled How People Learn: Brain, Mind, Experience and School. First, classrooms and school need to be learner centered.

By this, teachers need to be aware of the strengths, skills, attitudes and knowledge that students bring with them when they enter school. This should include acknowledging cultural differences and creating a place for the inclusion of their everyday lived experiences in the classroom. Second, teachers should strive to create a knowledge-centered classroom by focusing on what is taught, why it is taught and what competence or mastery looks like. The emphasis here should be placed on learning with understanding. One way students can demonstrate this understanding is by successfully transferring content and skills to novel situations and problems. This also relates back to metacognitive skills that have been demonstrated to be linked to learning goal orientation. Next, it is important to remember that formative assessments are essential in learning environments. This type of ongoing assessments allows teachers to assess where students are and design their instruction accordingly. Lastly, it is very important to look at the environment in which learning takes place. The teacher wants to create an environment that nurtures a learning goal orientation as opposed to a performance goal orientation. This means encouraging a community of learners who are willing to take risks and make mistakes for the sake of learning. Teachers should create environments that emphasize mastery over performance.

Performance is primarily focused on learning in the moment and a demarcated demonstration of understanding. Mastery implies skill development over a period of time that includes experience and practice. Authentic learning occurs when students can not only demonstrate understanding but apply it in multiple settings and to novel situations or problems. To achieve authentic learning, an adolescent, no doubt, requires goal orientation skills. Goal orientation skills of secondary school students cannot be separated from the background of the individual. Very important to any

individual's background is the teachers' perception under which the students (he/she) grows. Thus, teachers' perception is very crucial to social development of secondary school students in mathematics.

Decision-making Skills

Decision-making according to Lee (2016) is regarded as the cognitive process resulting in the selection of a belief or a course of action among several alternative possibilities. Every decision-making process produces a final choice, which may or may not prompt action. According to Tsui (2016) decision-making is the process of identifying and choosing alternatives based on the values and preferences of the decision-maker. Decision-making according to Stone (2016) can be regarded as a problem-solving activity terminated by a solution deemed to be satisfactory. It is therefore a process which can be more or less rational or irrational and can be based on explicit or tacit knowledge. Stone averred that human performance has been the subject of active research from several perspectives: Psychological: examining individual decisions in the context of a set of needs, preferences and values the individual has or seeks. Cognitive: the decision-making process regarded as a continuous process integrated in the interaction with the environment. Normative: the analysis of individual decisions concerned with the logic of decision-making, or communicative rationality, and the invariant choice it leads to.

A major part of decision-making involves the analysis of a finite set of alternatives described in terms of evaluative criteria. Then the task might be to rank these alternatives in terms of how attractive they are to the decision-maker(s) when all the criteria are considered simultaneously. Another task might be to find the best alternative or to determine the relative total priority of each alternative (for instance, if alternatives represent projects competing for funds) when all the criteria are considered simultaneously. Solving such problems is the focus of multiple-criteria decision analysis (MCDA). This area of decision-making, although very old, has attracted the interest of many researchers and practitioners and is still highly debated as there are many MCDA methods which may yield very different results when they are applied on exactly the

same data, (Kreks, 2017). This leads to the formulation of a decision-making paradox. Logical decision-making is an important part of all science-based professions, where specialists apply their knowledge in a given area to make informed decisions. For example, medical decision-making often involves a diagnosis and the selection of appropriate treatment.

But naturalistic decision-making research shows that in situations with higher time pressure, higher stakes, or increased ambiguities, experts may use intuitive decision-making rather than structured approaches. They may follow a recognition primed decision that fits their experience and arrive at a course of action without weighing alternatives. The decision-makers environment can play a part in the decision-making process. For example, environmental complexity is a factor that influences cognitive function. A complex environment is an environment with a large number of different possible states which come and go over time. Studies done at the University of Colorado have shown that more complex environments correlate with higher cognitive function, which means that a decision can be influenced by the location. One experiment measured complexity in a room by the number of small objects and appliances present; a simple room had less of those things. Cognitive function was greatly affected by the higher measure of environmental complexity making it easier to think about the situation and make a better decision. Research about decision-making is also published under the label problem solving, in particular in European psychological research. It is important to differentiate between problem analysis and decision making.

Traditionally, it is argued that problem analysis must be done first, so that the information gathered in that process may be used towards decision-making. Problems are merely deviations from performance standards Problems must be precisely identified and described Problems are caused by a change from a distinctive feature something can always be used to distinguish between what has and hasn't been affected by a cause Causes of problems can be deduced from relevant changes found in analyzing the problem. Most likely, cause of a problem is the one that exactly explains all the facts, while having the fewest assumptions, (Amawo, 2017).

There are steps that are generally followed that result in a decision model that can be used to determine an optimal production plan. In a situation featuring conflict, role-playing may be helpful for predicting decisions to be made by involved parties.

Analysis paralysis is the state of over-analyzing (or over-thinking) a situation so that a decision or action is never taken, in effect paralyzing the outcome. Information overload is "a gap between the volume of information and the tools we have to assimilate" it. Excessive information affects problem processing and tasking, which affects decision-making. Stone (2016) described an "illusion of knowledge", which means that as individuals encounter too much knowledge it can interfere with their ability to make rational decisions. Evaluation and analysis of past decisions is complementary to decision-making. Decision-making techniques can be separated into two broad categories: group decision-making techniques and individual decision-making techniques. Individual decision-making techniques can also often be applied by a group.

Consensus decision-making tries to avoid "winners" and "losers". Consensus requires that a majority approve a given course of action, but that the minority agrees to go along with the course of action. In other words, if the minority opposes the course of action, consensus requires that the course of action be modified to remove objectionable features. Majority requires support from more than 50% of the members of the group. Thus, the bar for action is lower than with consensus. Plurality, where the largest block in a group decides, even if it falls short of a majority. Range voting lets each member score one or more of the available options. The option with the highest average is chosen. This method has experimentally been shown to produce the lowest Bayesian regret among common voting methods, even when voters are strategic. Delphi method is structured communication technique for groups, originally developed for collaborative forecasting but has also been used for policy making, (Lee, 2016).

Dotmocracy is a facilitation method that relies on the use of special forms called Dotmocracy Sheets to allow large groups to collectively brainstorm and recognize agreement on an unlimited number of ideas they have authored. Participative decision-making

occurs when an authority opens up the decision-making process to a group of people for a collaborative effort. Decision engineering uses a visual map of the decision-making process based on system dynamics and can be automated through a decision modeling tool, integrating big data, machine learning, and expert knowledge as appropriate. Decisional balance sheet: listing the advantages and disadvantages (benefits and costs, pros and cons) of each option, as suggested by Plato's *Protagoras* and by Benjamin Franklin. Simple prioritization: choosing the alternative with the highest probability-weighted utility. This may involve considering the opportunity cost of different alternatives.

Sense of Belonging Skills

Having a sense of belonging is a common experience. According to Jida (2017), belonging means acceptance as a member or part. Such a simple word for huge concept. A sense of belonging is a human need, just like the need for food and shelter. Feeling that you belong is most important in seeing value in life and in coping with intensely painful emotions. Some find belonging in a church, some with friends, some with family, and some on Twitter or other social media. Some see themselves as connected only to one or two people. Others believe and feel a connection to all people the world over, to humanity. Some struggle to find a sense of belonging and their loneliness is physically painful for them. Some seek belonging through excluding others, (Yancho, 2016). That reflects the idea that there must be those who don't belong in order for there to be those who do. Yet a single instance of being excluded can undermine self-control and well being and often creates pain and conflict. A sense of belonging to a greater community improves your motivation, health, and happiness. When you see your connection to others, you know that all people struggle and have difficult times. You are not alone. There is comfort in that knowledge.

To build a sense of belonging requires active effort and practice. One way to work on increasing your sense of belonging is to look for ways you are similar with others instead of focusing on ways you are different, (Kyap, 2019). Someone is much older than you? Maybe they have wonderful stories to tell and you love to listen

to their experiences. Maybe you value making a difference and can contribute to their lives with your youthful strength. Someone has a different belief system that you? Maybe you both enjoy a good debate or you both value faith in God. Sharing your differences and still accepting the person creates peace. Acceptance does not mean agreement. Another way to build your own sense of belonging is to work on acceptance of others. To accept others and views that are not the same as yours may require that you open your thoughts to the idea that there is value in everyone's thinking. You can find truth in even the most difficult-to-understand even though you may not agree. One of the best ways to communicate acceptance is through validation. Validation builds a sense of belonging and strengthens relationships. Validation is the language of acceptance.

Umar (2018) averred that validation is the acknowledgement that someone's internal experience is understandable and helps you stay on the same side, with a sense of belonging, even when you disagree. Try saying yes to opportunities to be with others and then throw yourself in to whatever the activity is. Let go of your judgments. Judgments build walls. Focus on people. At a dinner and annoyed because you don't like the food? The food is not the goal. Connecting with others is far more important than the food or the noise in the restaurant. Gained weight and don't want others to see? Stop isolating until you believe you are worthy.

Sense of belonging as a concept is often used interchangeably with social integration. In a longitudinal study, Hurtado and Carter explored a set of factors associated with sense of belonging, concluding that these were essential contributors to people persistence. By including a separate measure of sense of belonging, researchers are able to examine both the participation in particular activities and what that participation means to people. Following this it can be argued that sense of belonging taps into feelings or perceptions of association or group membership, (Jida, 2017). The way to practice is the way to involve. People with great involvement in a group will feel that they are needed in that group, will think that the group belongs to them, because they’re the ones who hold the steer and naturally feel responsible to where they and their group will go. By involving people to do something in our

group, we actually practice them to have a sense of belonging to our group. So, this is related to communication: how we know to involve them depends on how we build our relationship with them. Lastly, when is it the right time to feel a sense of belonging? Right now of course. A group that lacks people with a great sense of belonging won't go anywhere. You will only find tiredness. No great work achieved. No growth. No self-improvement. Well, if you are the ones who have realized that you feel happy when doing something to your group, congratulations, you have gained a sense of belonging. Make every effort to properly 'practice' your people skills so that they feel happy too. But, if you're the ones that still do not get this writing, and fortunately realize that you haven't had a sense of belonging to any group or society you're in, think twice and let yourself be humble enough to learn how, (Umar, 2018).

Talking about a sense of belonging is talking about something where we belong in which unity is needed to finally do the vision in togetherness. Because a sense of belonging shall define how united we are, eventually.

Tolerance Skills

According to Kayto (2016), tolerance or toleration is the state of tolerating, or putting up with, conditionally. Zadan (2018) added that although tolerance may refer to the capacity to endure continued subjection to something such as a drug or environmental conditions without adverse reaction as well as an allowable amount of variation of specified quantity, especially in the dimensions of a machine or part, in psychology, tolerance is the ability or willingness to tolerate the existence of opinions or behaviour that one dislikes or disagrees with. Generally, tolerance skills are concerned with one's ability to co-exist with people from different culture, tribe, religion, background and class. This co-existence maybe at school, work, market, etc.

Tolerance skills involve ability to co-exist very well with a person of different tribe, religion, ethnicity, socio-status, race and even different manners from that of the adolescent. Moreso, it requires competences to work closely with anyone irrespective of his religious affiliation, tribe, class, status, background, etc.

Tolerance skills according to Vasco (2019) form a very vital component of social development competences. This, Cherry explained is because development does not occur in isolation. Development of the total being involves other people either as contributors or beneficiaries of the development. To involve other people, one needs to tolerate them. Secondary school students hardly work alone. Since companions and friends disagree to agree, quarrel and settle, fight and reconcile, tolerance is indispensable, (Enyi, 2017). An adolescents' ability to tolerate his peers, companions and friends may be determined by his home background. It is important to note that parenting style is the foundation upon which home backgrounds are built, (Charles, 2019).

Relationship Skills

Relationship skills according to Pedro (2018) are those skills that help the adolescent maintain good connection or association with other people. Okon argued that an adolescent with good relationship skills will avoid making other people feel bad. Thus, he (the adolescent) will always seek the good, happiness and total wellbeing of other people around him. Becky (2019) suggested that a better strategy for maintain good relationship is one trying to contribute his fair share when relating with other people or when working in a group. Gumel averred that a selfish person will naturally lack good relationship skills. Such persons do not value teamwork. In this age of networking, co-existence, co-habitation and interdependence it is vital that secondary school students be groomed to value good relationship, (Al-Jaradeen, 2016).

Chieze (2016) hinted that relationship skills entail listening to other people's ideas. Chieze adviced secondary school students to always speak their truth and listen to others, for even the doll and ignorant have their stories to tell. To Pedro (2018) relationship skills address one's competences in relating with other people, not hurting them deliberately and valuing relationship with others. Pedro stated that an adolescent is most likely to protect and preserve relationships which he values. When one values his relationship with another person, he can hardly willingly hurt such a person. Also when one

hurts another person, a way to maintain or restore the relationship between them is to apologies and show reasonable remorse.

Al-Jaradeen (2016) listed three attributes of good relationship skills. First is self control or specifically ability to control ones' self when angry. Al-Jaradeen explained that good relationship skills will help an adolescent to control his anger when he has a disagreement with a friend. Another attribute is openness. In openness Lee warned that the adolescent must aim at solving problems that is, proffering solutions to problems that may likely affect relationship negatively. Secondary school students with this attribute can discuss a problem with a friend without making things worse. The third attribute in Al-Jaradeen's list is respect for other people's points of view. This Al-Jaradeen explained, should happen even when the individual has cause to disagree with such views. It should therefore be noted that disagreement with a persons' view does not necessarily mean disrespect for such views especially when such views are not treated with contempt. Teachers' perception may help in molding good relationship skills. However, there is no definitive conclusion on how teachers' perception influence relationship skills as an index of social development among secondary school students.

Students' Performance in Mathematics

Jimoh (2017) asserted that the word "performance" is the noun form of the verb "perform". Hence, performance is the process of bringing about or accomplishing something through effort, skill or courage. In this work, performance strictly refers to academic performance and more specifically, academic performance in senior secondary school subjects. Academic performance generally suggests a performance relating to education and scholarship, (Tsui, 2016). According to Dickson (2016), academic performance depicts students' performance on a standard of measurement such as performance test, skill test, analytical thinking test, etc. It is therefore, not out of place to describe academic performance as the gain in knowledge of students as a result of taking part in a learning activity or programme. Learning here refers to changes in a person's behavioural repertoire rather than just a change in behaviour.

Academic performance is a result-oriented construct that encapsulates the extent of performance of a desired task, (Jida, 2017).

Academic performance is a multifaceted construct that comprises different domains of learning. Based on this, the definition of the concept varies among educators, policy makers and other stakeholders in education. In the view of Becky (2019) educational/academic performance is seen as performance outcome that indicate the extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in school, colleges and university. Adams (2016) described academic performance as the outcome of education, the extent to which a student, teacher, institution has achieved their educational goals. Ment (2017) saw academic performance as the level of schooling one have successfully completed and the ability of one to attain success in one's studies. It includes when one receives great grades or when one attends college and graduate school. In developed societies, academic performance plays important role in every person's life. It is measured by the grade point average (GPA) or by standardized assessment designed for selection purpose such as the scholastic assessment test (SAT).

Becky (2019) argued that since academic performance is a measure of students' success in an academic setting, it is therefore, the goal of parents, teachers and school administrators to foster performance. Pedro (2018) stated that students' academic performance in secondary schools, just like every other educational level is usually done using assignments, projects, tests and examinations. These performance measurement tools are used to assess (evaluate) the worth of the students' learning and as well predict their future academic endeavour. Kuntu (2017) provides a through overview of the assessment of academic performance. To him, standardized performance tests are important indicators of academic performance because they provide more objective rating of academic performance than grades. Ralph (2015) identified some factors that could determine students' performance. They include; teacher-qualification, teacher's knowledge of the subject matter and ability to deliver effectively, environment, students' state of mind,

students' readiness, teaching method, availability, utilization and suitability of instructional aids, teacher motivation, student's self esteem as well as parental attachment. Hence, this study which aims at determining teachers' perception of social development skills needed by secondary school students for improved performance in mathematics is not only vital but very timely

.

Influence of students' gender

Akan (2017) asserted that gender refers to the socially, culturally constructed characteristics and roles which are ascribed to males and females in any society. Gender is a major factor that influences the students' behaviour including career choice and subject interest of the student. According to Ndeke (2018), gender or sex refers to those characteristics of males and females which are biologically determined such as possession of the male and female reproductive genital organs. Nweke further gave a broad analytical concept which draws out female role responsibilities in relation to those of males describing the males attribute as bold, aggressive, tackful economical use of words, while females are fearful, timid, gentle, dull, submissive and talkative. Damte (2019) alleged that in schools, males are more likely to take difficult subjects areas like sciences, while the females take to careers that will not conflict with marriage chances, marriage responsibilities and motherhood and this may influence their study behaviour.

Evidently, teachers also, encourage gender stereotype by giving different treatment to males and females. Teachers go further to give different career guidance to males and females. The society frowns at seeing a man cooking or a female climbing a tree. Nigeria, since she gained her independence had never produced a female President. To correct this abnormally, it is expected that the leading experiences offered to the children in schools should not discriminate against males and females. Gender discrimination cut across almost every sphere of lives of citizens of developing nations such as Nigeria. It is therefore not a surprise to hear secondary school teachers arguing that some social development skills are gender sensitive and gender based. With this in mind, many

secondary school teachers seem to believe that most skills are gender sensitive.

It is evident that both male and female youths participate in solving problem alike. Today, there are instances of boys and girls lured into sexual perversion, armed robbery, cultism, ritualism, alcoholism, substance abuse and recklessness resulting from inability to solve problems very well. On the other hand, instances abound of many boys and girls who have one form of positive influence or the other, ranging from career development to self-actualization. Both male and female students are equally exposed to problems in academics, social life and other spheres of human endeavor. They (the students) will be better groomed to tackle such problems when their teachers realize this fact.

Unarguably, there is need to see that both the males and females are given equal study opportunities. Researchers have submitted conflicting findings on perception of male and female mathematics teachers regarding social development skills needed by secondary school students for improved performance in mathematics. Cherry (2015), Stone (2016), Kayto (2016), Chieze (2016) and Kyap (2019) reported that female teachers perceived that secondary school students needed social development skills for improved performance in mathematics higher than their male counterparts. But Zippoh (2016), Lee (2016), Yancho (2016), Pedro (2018) and Vasco (2019) found that male teachers perceived that secondary school students needed social development skills for improved performance in mathematics higher than their female counterparts. Whereas, Babalola (2016), Amawo (2017), Jida (2017), Becky (2019) and Charles (2019) reported no significant difference between the perceptions of male and female mathematics teachers on social development skills needed by secondary school students for improved performance in mathematics. With regard to the foregoing, the task before the researcher in this work was to bridge this gap of no definitive conclusion.

CLUSTER II

THEORETICAL FRAMEWORK

CHAPTER 12

Topic:

EFFECT OF AUDIO ANIMAION INSTRUCTURAL MEDIA ON MIDDLE BASIC EDUCATION PUPILS' ACHIEVEMENT AND INTEREST IN ENGLISH LANGUAGE IN AGBANI EDUCATION ZONE

Hereunder are review of theories related to this topic.

Piaget's Cognitive Developmental Stage Theory

The developmental stage theory was postulated by Jean William Fritz Piaget a Swiss psychologist born 9th August 1896 in Neuchatel Switzerland. Jean Piaget theorized on cognitive development as a comprehensive theory about the nature and development of human intelligence but in fact it deals with the nature of knowledge itself and how humans come gradually, to acquire it, construct it, and use it. This happened before Piaget's death on 16th September 1980 at Geneva Switzerland. Moreover, Piaget claims that cognitive development is at the center of human organism and language is contingent on cognitive development. Below is a description of the stages through which it develops until maturity. These stages of cognitive theory are:

1. Sensori-motor stage 0-2yrs
2. Pre-operational stage 2-7yrs
3. Concrete operational stage 7-11yrs
4. Formal operational stage 11-15yrs

Piaget believed that this process of understanding and changes involves two basic functions i.e. Assimilation and accommodation. Assimilation, one of two processes coined by Jean Piaget, described how humans perceive and adapt to new

information. It is the process of taking one's environment, and new information and fitting it into pre-existing cognitive schemes. Assimilation occurs when humans are faced with new or unfamiliar information and refer to previously learned information in order to make sense of it. Accommodation, unlike assimilation is the process of taking one's environment and new information and altering one's preexisting schemes in order to fit in the new information.

Piaget's theory has a major impact on the theory and practice of education. The theory focused attention on the idea of developmentally appropriate education with environment, curriculum, material, and instruction that are suitable for pupils in terms of their physical and cognitive abilities and their social and emotional needs. Piaget's postulations can be summarized thus;

- A focus on the process of children's thinking, not just its product in checking the correctness of children's answers, teachers must understand the processes children use to get to the answers. Appropriate learning experiences build on children's current level of cognitive functioning and only when teachers appreciate children methods of arriving at particular conclusion are they in a position to provide such experiences.
- Recognition of the crucial role of children's self-initiated active involvement in learning activities.

In a Piagetian classroom, the presentation of readymade knowledge is de-emphasized. Knowledge in children are encouraged to discover for themselves through spontaneous interaction, teachers provide a rich variety of activities that permit children to act directly on the physical world. Obviously, one of the ways teachers provide a rich variety of activities that permit children to act directly on the physical world is the use of instructional media such as Audio Instructional Media and Charts that were used in this study. A de-emphasis on practices aimed at making children adult like in their thinking. Piagetian based educational programs accept his firm belief that premature teaching could be worse than no teaching at all, because it leads to superficial acceptance of adult formulas rather than true cognitive understanding. Piaget's theory

assumes that all children go through the same developmental sequence but that they do so at different rates. Therefore, teachers must make a special effort to arrange classroom activities for individuals and small groups of children rather than for the total class group. In addition, individual assessment of children's educational progress should be made in terms of each child's own previous course of development, not in terms of standards provided by the performances of same age peers.

From the theory, it is clear that assimilation and accommodation works hand in hand. For a child to accommodate the fundamentals of literacy in school, what he has, i.e, what he/she has assimilated from the domestic homes and environment must agree with the new knowledge. Formalization of the theory of constructivism is generally attributed to Jean Piaget (1966-1980) who articulated mechanisms by which knowledge is internalized by learners. He suggested that through processes of accommodation and assimilation, individuals construct new knowledge from their experiences. When individuals assimilate, they incorporate the new experience into an already existing framework without changing that framework. Piaget saw play as an important and necessary part of the pupils' cognitive development and provided scientific evidence for his views.

Piaget posited that in order to encourage mental growth of children, the experience of seeing things from varied perspective is very necessary. Physical action is a base for learning. For a child to learn effectively, he must be an active participant in the class events or activities, not just a spectator. These features characterize the Audio Animation instructional media and charts that were used in this work. More-so, the Concrete operational stage 7-11yrs of the Piaget's classifications corresponds to the stage of the subjects of this study (Middle Basic Education Pupils).

Gagne's Theory of Hierarchical Learning

Gagne's theory of hierarchical learning was propounded by an American psychologist Robert Mills Gagne in 1988. The theory stipulates that there are several different types of learning. The significance of this classification is that each different type requires

different types of instruction. Gagne identifies five major categories of learning; verbal information, intellectual skills, cognitive strategies, motor skills and interest. Different internal and external conditions are necessary for each type of learning for example, for cognitive strategies to be learned, there must be a chance to practice developing new solution to problem. To learn interest, the learner must be exposed to a credible role model or persuasive argument. Gagne suggested that learning tasks for intellectual skills can be organized in a hierarchy according to complexity. The primary significance of the hierarchy is to identify prerequisites that should be completed to facilitate learning at each level. Prerequisites are identified by doing a task analysis of a learning/training task. Learning hierarchies provide a basis for the sequencing of instruction, hence they are in agreement with the principles of use of Audio Animation Instructional Media and charts that were the focus of this study.

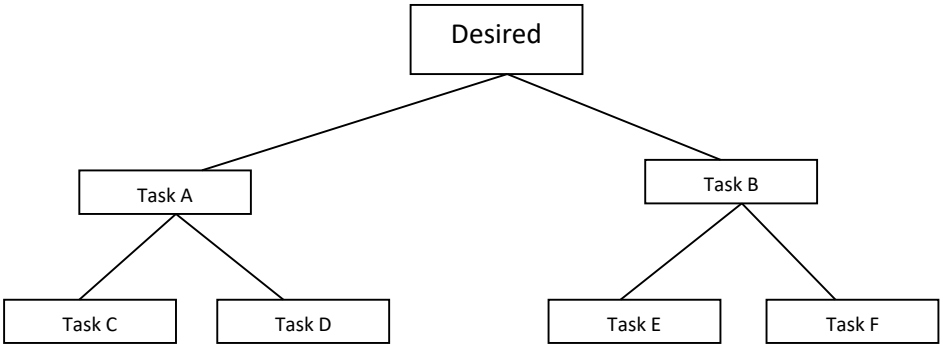
Furthermore, the theory outlines nine instructional events and corresponding cognitive process:

i. Gain attention (reception)
ii. Informing learners of the objectives (expectancy)
iii. Stimulating recall of prior learning (retrieval)
iv. Presenting the stimulus (selective perception)
v. Providing learning audience (semantic encoding) responding
vi. Providing feedback (reinforcement)
vii. Assessing performance (retrieval)
viii. Enhancing retention and transfer (generalization)

Gagne posited that these events should provide the necessary conditions for learning and serve as the basis for designing instruction and selecting appropriate media. Gagne recommended that in planning the lesson for instruction the teacher should always ask himself what will the learner need to know or do in order to deal with the new learning he/she is introducing. To answer the question, the teacher will organize the learning material in a hierarchical fashion from simple to complex so that the learner first masters the

verbal knowledge and skill (i.e task) that are necessary for the new learning to take place. This hierarchy of task which show what should be learned with the desired new learning at the top.

This is illustrated below:



In order to perform task A one must be able to perform the prerequisites of task C and D and for task B, one must master E and F.

Someone begins with simple prerequisites and works up in a hierarchical fashion to the terminal task or desired knowledge which is the capability sought. The teacher would then start instruction by first carrying out a diagnosis of what the learner already knows. The test would reveal some part or parts of hierarchy at which the learner could be instructed. From the theory, we deduced that learning is a prerequisite to the terminal knowledge. The tenets of this theory are in line with the characteristics of Audio Animation Instructional Media and charts. Moreso, major variables of this study such as pupils' achievement and interest are all correlates of learning which Gagne's theory is based upon.

Ausubel's Subsumption Theory

Ausubel's Subsumption theory was postulated by David Paul Ausubel an American psychologist in (1963). Ausubel's theory centers on the process of meaningful and Rote learning. Meaningful

learning occurs when new knowledge is consciously linked to existing concepts (i.e subsumers) the learner already knows. Subsumers will optimize meaningful learning. But where the "subsume" does not exist he recommends the use of what he called "advance organizers". Advance organizer is in the form of introductory material presented in advance of the learning itself to link already known materials to the new materials to be learnt. He uses the term subsumption to suggest how the existing knowledge of the learner interacts with the new knowledge.

In contrast to meaningful learning, rote learning occurs when one acquires new information without specific association with existing concepts in his cognitive structure (i.e knowledge store). Ausubel criticized Bruners discovery approach as being too time consuming and insufficient to be considered as a primary method of presenting subject matter. Rather he maintains that if the materials can be meaningfully organized by the instructor, the need for pupil's discovery is removed and the process of learning is rendered efficient. A valuable practical application of Ausubel's theory is for the teacher to tie the new material to what the learner already knows. The teacher can either use such subsumers or empty appropriate ones for the learner in the form of carefully developed advance organizer. The organizer can be a question, a demonstration, a definition, an analogy, a film or animated tips in an Audio Animation such as the one designed for this study. Teachers should also employ the practice of alerting their pupils in advance of what topic that will be treated next and furnish them with the relevant references, bearing in mind its relevant to what the pupil already know.

Teachers should refrain from the unsound pedagogical practice of withholding information about certain books or other sources of information because they do not want the learners to access them. Ausubel maintained that meaningful learning's occurs when new knowledge is consciously i.e knowingly linked to existing concepts (i.e subsumers) the learner already knows. Ausubel's theory is consistent with this study because meaningful learning is a cognitive activity and in line with the objectives of literacy one of which is to stimulate creativity, rationality and innovative thinking

in the learners. Similarly, it is only meaningful learning that are likely to influence pupils' achievement and interest in a school subject such as English language. Also, use of instructional media such as the audio animations and charts are all aimed at promoting meaningful learning.

CHAPTER 13

Topic:

INFORMATION AND COMMUNICATION TECHNOLOGY COMPETENCIES NEEDED FOR EFFECTIVE TEACHING AND LEARNING OF EDUCATIONAL TECHNOLOGY COURSES IN UNIVERSITIES IN SOUTH EAST NIGERIA

Hereunder are review of theories related to this topic.

Gunilla Bradley's Convergence Theory on ICT, Society and Human Beings

Gunilla Bradley's Convergence Theory on ICT, Society and Human Beings was propounded by Gunilla Bradley in 2010 at school of ICT, Royal Institute of Technology Stockholm. Gunilla Bradley set to address interdisciplinary research and development on the interplay between ICT, Society, and Human Beings. Bradley posited that all technologies are *for* humans and should facilitate and improve our wellbeing and quality of life. Both Convergence and Interactions are important features in Bradley's theory. According to Bradley, *Convergence* here means a move towards a common content. *Interaction* means that technology interacts with the social world with values and beliefs. There is also an ongoing interaction between the "clusters of circles". Bradley postulated *four levels of analysis* namely, individual, organizational, communal, and societal. A convergence is occurring between Technology, Norms/Values (Economy) and Labour Market and is entitled *Globalisation*. Values related to the economic system is a strong driver.

The geographical span is changing. At present, our work life is mainly based on national and international trade which will become more global. Electronic commerce and electronic market

places are creating a strong change factor behind the structure of work life. The geographical space in the future is both global and beyond – including applications of virtual reality (VR). According to Bradley, a convergence of computer technology, telecommunication technology and media technology is occurring to become what is defined as ICT. ICT is increasingly being used in almost every activity and embedded in more and more things (ubiquitous computing). Consequently, higher educational sector such as the university cannot be left out when you talk about ICT importance. This is because universities train students on many ICT based disciplines one of which is Educational Technology.

The university is, no doubt, a knowledge transference and knowledge acquisition organization. Knowledge organization and knowledge workers are increasing. In these organizations knowledge is managed in new ways. In the 21st Century there are multiple communication channels - word of mouth, writing, audio visual, and electronic. Meta channels, e.g. Meta media of virtual reality (VR) and controlled reality environments (environments that we manipulate and manage in VR) are increasingly applied. ICT becomes a converging facilitator, a bridge builder between the machines, the humans, the society and the Organizational objectives. Information can be communicated effectively via ICT even after normal working hours. Urgencies and emergencies can effectively be taken care of through the convergence nature of ICT. Gunilla Bradley's Convergence Theory on ICT, Society and Human Beings has much to do with this study.

It is therefore unthinkable to suggest that teaching and learning of Educational Technology courses in universities can be done without the required ICT competencies. While emphasizing ICT competencies for teaching and learning of Educational Technology courses in universities, we should key in to Gunilla Bradley's view that all technologies (ICT) are for humans and should facilitate and improve our wellbeing and quality of life. Thus, ICT competencies required for effective teaching and learning of Educational Technology courses in university should also facilitate and improve the wellbeing and quality of life of Educational

Technology lecturers and students. Consequently, the university products will turn out to be useful to the society at large.
Gunilla Bradley's Convergence Theory on ICT, Society and Human Beings addressed ICT interaction with society and human beings but failed to look into technology acceptance which is very important. Hence, the need to review Fred Davis' Theory of Technology Acceptance which addressed the issue.

Fred Davis' Theory of Technology Acceptance

The Theory of Technology Acceptance was propounded by Fred Davis in 1986. The Technology Acceptance theory is an information systems theory that models how users come to accept and use a technology. The primary objective of the theory was to shed light on the processes underpinning the acceptance of technology, in order to predict the behaviour of and provide a theoretical explanation for the successful implementation of technology. The practical objective of the theory was to inform practitioners about measures that they might take prior to the implementation of systems. To fulfil the objectives of the theory, several steps were carried out. Davis embarked on the development of the model of technology acceptance by framing the processes mediating the relationship between external variables and actual system use. The *actual system use* is the end-point where people use the technology. *External variables* such as social influence is an important factor to determine the attitude.

When these the models are in place, people will have the attitude and intention to use the technology. However, the perception may change depending on age and gender because everyone is different. Davis represents the behaviour as the outcome predicted by perceived usefulness, perceived ease of use and behavioral intention. The theory suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. *Perceived usefulness* (**PU**) was defined by Davis as "the degree to which a person believes that using a particular system would enhance their job performance". It means whether or not someone perceives that technology to be useful for what they want to do. *Perceived*

ease-of-use (**PEOU**) – Davis defined perceived ease-of use as "the degree to which a person believes that using a particular system would be free from effort". If the technology is easy to use, then the barrier is conquered. If it's not easy to use and the interface is complicated, no one has a positive attitude towards it.

Davis added that Perceived ease of use and perceived usefulness capture the expectations of positive behavioral outcomes and the belief that behaviour will not be labor-consuming. Behavioral intention is a factor that leads people to use the technology. The behavioral intention (BI) is influenced by the attitude which is the general impression of the technology. Behavioral intention can be substituted by the attitude toward behaviour which is an affective evaluation of the potential consequences of the behaviour. The higher the affective response, the higher is the likelihood that the behaviour will take place. The effect of perceived usefulness on actual use can be direct, which underscores the importance of the variable in predicting behaviour. Although perceived ease of use does not affect use behaviour directly, it underpins the effect of perceived usefulness.

Fred Davis conducted numerous experiments to validate the theory by using PEOU and PU as two independent variables and system usage as the dependent variable. He found that PU was significantly correlated with both self-reported current usage and self-predicted future usage. The development of the model and measures for technology acceptance have made significant theoretical contributions and have had a great practical value. The application of the model for testing Information System usability has made it possible to evaluate the motivation of users to adopt a range of technologies which had not been done before due to a lack of validated subjective measures. The development of constructs which had a strong and significant correlation with use behaviour made it possible to understand the cognitive and affective factors mediating the effect of system characteristics on technology acceptance.

There are people who do not use technology or nontechnology users also referred to as individuals who lack skills to use technology. These people do not accept technology mainly

for fear of being laid off by technology. Rather than taking up the challenge to acquire technology competences and skills, they settle for criticism and do all within their reach to sabotage technology use. Fred Davis theory of technology acceptance is very relevant to these present study. Davis theory implies that if ICT is expected to be easy to use, the more likely it is that it will be considered useful for the user and the more likely it is that this will stimulate the acceptance of the technology and willingness to acquire skills needed to utilize the technology.

Technology Acceptance is a topical issue in Educational Technology because one cannot realistically portray the importance and usefulness of Educational Technology if lectures and students do not accept ICT which is the bedrock of modern technology. As a result, ICT for Educational Technology must be designed to facilitate the users' perceived usefulness as well as users' perceived ease-of use which will ultimately determine users' desire and value for ICT competences. Fred Davis' Theory of Technology Acceptance and Gunilla Bradley Convergence Theory of ICT, Society and Human Beings failed to address learning with respect to ICT competences. Hence, necessitating the review of John Sweller's Cognitive Load Theory to address the issue.

John Sweller's Cognitive Load Theory

John Sweller's Cognitive load theory is a cognitivist learning theory introduced in 1980 by John Sweller, an Australian educational psychologist. Learning according to Sweller is an **alteration in the long-term memory**, which in humans has practically unlimited capacity. That capacity is used to store knowledge in schematic forms, where **schemata**, according to Sweller represent "*cognitive constructs that incorporate multiple elements of information into a single element with a specific function*". The working memory is very important in the learning process because in order to reach long-term memory storage, information first has to be retrieved and processed by the working memory. After acquiring a new schema (verbal, pictorial, spoken or written), it can be further extended and improved by practice and finally automated (for example operation of reading). If a schema is

automated, conscious effort needed to perform a task related to it will be decreased. Since its inception in 1980, the theory has used aspects of human cognitive architecture to generate experimental, instructional effects.

These effects are demonstrated when novel instructional procedures are compared with more traditional procedures as part of a randomized, controlled experiment. If the novel procedure facilitates learning, based on test performance, a new effect may have been demonstrated, an effect generated by our knowledge of human cognition. The new instructional procedures that follow from the effect become candidates for relevant professionals such as instructional designers and teachers. According to the Sweller, during the process of learning, a cognitive load is imposed on the working memory. For learning to be efficient, the amount of cognitive load imposed must not exceed the capacity available. Cognitive load theory suggests three types of cognitive load.

- ***Germane cognitive load****:* This type of cognitive load is caused by the learners own **active effort to construct new schemata**. "*Effective instructional methods encourage learners to invest free processing resources to schema construction and automation, evoking germane cognitive load.*

- ***Extraneous cognitive load****:* This type of cognitive load is caused by **inappropriate instructional designs** that do not take into considerations mentioned limitations and architecture of human memory. Sweller proposed various methods for improving instructional design. Most of them is oriented on learning from multimedia materials, that is ICT.

- ***Intrinsic cognitive load***: This type of cognitive load is caused by **element interactivity** or inherent complexity of the information which needs to be processed. For example, when translating a number of words intrinsic cognitive load is quite small, but when translating same number of words forming part of a sentence intrinsic cognitive load is higher

since not only meanings of individual words, but also their relations must be analyzed. Newly suggested techniques to reduce intrinsic load include simple to complex ordering or molar instead of modular presentations.

Cognitive load types are **additive**. That means the reduction of extraneous cognitive load may allow an increase in germane cognitive load. Also, if intrinsic cognitive load is rather low (information to learn is not complicated), it can be learned even though extraneous cognitive load is rather high (learning material is badly designed). John Sweller's Cognitive Load Theory is consistent with this present study in many ways. John Sweller's proposed various methods for improving instructional design, most of them is oriented on learning from multimedia materials, that is ICT. Unarguably, multimedia is ICT-based and no one can use multimedia efficiently and effectively without required ICT competences. Sweller posited that *Effective instructional methods encourage learners to invest free processing resources to schema construction and automation, evoking germane cognitive load. Undoubtable, ICT based instructional methods have consistently proved to be effective. More-so, all automation processes in the 21st century are ICT-based and there can be properly harnessed only with the required ICT competences. Frankly, ICT reduces cognitive Load for learners because with ICT practical's, learners do not need to border their brains with the over load of cramming. This is because when they learn through ICT, they are likely to retain and recall all that they learnt with much ease.*

CHAPTER 14

Topic:

STUDY SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED ACADEMIC PERFORMANCE IN COMPUTER STUDIES IN ENUGU STATE

Hereunder are review of theories related to this topic.

Bandura's Social Cognitive Learning Theory

Bandura's Social Cognitive Learning Theory was propounded by a renowned Stanford University psychology expert, Albert Bandura in 1997. In the social cognitive theory, Bandura states that "social and cognitive factors, as well as behaviour play important role in learning". To explain this theory, Bandura developed what he called "Reciprocal Determinism Model". The model is a double headed triangle. The three vertices represented behaviour, person/cognition and environment. The implications are that environment influences behaviour and that behaviour influences environment; person factor influences behaviour and vice versa; person factor influences environment and vice versa. The person factor which Bandura meant are personality trait, temperament and cognition. In a simplified way, these include introverted, extraverted, active or inactive, calm or anxious, friendly or hostility. Others are expectations, beliefs, attitudes, strategies, thinking and intelligence. These traits or attributes enumerated by Bandura, are very important to students' study skills.

As a matter of fact, students' study skills are products of students' personality traits and attributes such as their (students') temperament, cognition, expectation, beliefs, strategies, attitudes, thinking and their intelligence. Bandura also thought about imitation. No doubt, students are most likely to imitate their teachers in many ways including study skills. Thus, this underscores the

necessity of having male and female teachers who perceive correctly, the study skills needed by students for improved academic performance in computer studies. Perhaps, such teachers will mentor and influence the students to develop and use helpful study skills as they (the students) imitate them (the teachers). Bandura's social cognitive learning theory linked behavioral trails to students' study skills but did not do justice to students' academic performance. Hence the need to review Reynolds and Walberg's Theory of Academic Achievement to fill the gap.

Reynolds and Walberg Theory of Academic Achievement

The theory of academic achievement was propounded by Reynolds, A.J and Walberg, H.J, in 1992. In this theory Reynolds and Walberg posited that psychological characteristics of individual students and their immediate psychological environments influence educational outcomes (cognitive, behavioral and attitudinal). Reynolds and Walberg developed a model including nine factors hypothesized to influence the learner's educational outcomes. These learners' educational outcomes can be referred to as learners' academic achievement or learners' academic performance. These nine factors include (a) ability or prior achievement, (b) age, (c) motivation or self-concept, (d) quantity of instruction, (e) quality of the instructional experience, (f) the home environment, (g) the classroom or school environment, (h) the peer group environment, and (i) the mass media. Reynolds and Walberg's model extends beyond earlier models of academic learning by examining out-of-school influences and social-psychological variables.

The remaining variables involve the educationally stimulating psychological environment, both within and outside the classroom. The first three variables in Reynolds and Walberg's model (ability, age, and motivation) can each be seen as internal traits to the learner or student aptitude. Ability or prior achievement, for Reynolds and Walberg, includes factors that can be measured by "the usual standardized test". These factors would include the learner's aptitude, ability, and IQ, as well as previous academic achievement. Reynolds and Walberg has assessed this variable using students' mathematics, science, and reading cognitive subtest

scores on the National Assessment of Educational Progress. For Reynolds and Walberg, the age variable includes chronological age, but also development and stage of maturation. Reynolds and Walberg attempted to keep the age variable as a constant. Self-concept, in the Reynolds and Walberg model, is conceptualized as the learners' willingness to persevere intensively on learning tasks.

Self-concept can also be linked to the learners' self-efficacy, that is, how they (learners) perceive their personal abilities or capabilities. Quality of the instructional experience includes psychological and curricular experiences, and can be seen as the appropriateness of the instructional experience. This quality can also be linked to quantity of instructional experience or years of professional experience. This is because the quality experience may be acquired through constant practice and trainings both of which may come as years of experience appreciate. The final variables: home environment, classroom or school environment, peer group environment, and mass media, are characterized as environmental factors. Home environment refers to the support given to students while at home. Classroom and school environment, including classroom morale, refers to the classroom as a social atmosphere and has been measured through access to classroom materials and facilities.

Others have measured classroom and school environment through student reports of feeling put-down by the teacher or by other students in the classroom. Peer group environment refers to how well students get along with one another. The mass media variable refers to the minimum leisure-time spent on mass media by the learners. Reynolds and Walberg's theory of academic achievement is very relevant to this study in many aspects. Academic achievement as conceptualized by Reynolds and Walberg reflect the same sense in which academic performance is conceptualized in the context of this study, that is, learning outcome or the gain in knowledge of learners as a result of taking part in a learning activity, course of study or programme. Reynolds and Walberg's conceptualization of out of school or out of classroom influences and social psychological variables align very well with indices of study skills articulated in this study. Reading,

Concentration, Time management, and preparation for examinations may take place out of school or out of classroom.

Furthermore, the environmental factors expounded by Reynolds and Walberg namely home environment, classroom or school environment and peer group environment were adequately linked to students' academic performance which requires useful study skills to attain. Evidently when students receive adequate support at home, gets satisfactory classroom morale booster and gets along very well with their peers, such students are most likely to study very well. Reynolds and Walberg in their experiments, accessed the variables using Reading Cognitive Subtest. Interestingly, Reading skills are key variables in this study. Conclusively, Reynolds and Walberg emphasized constant practice and training in expounding their theory. Evidently, studying involves constant practice and training. Hence, Reynolds and Walberg's Theory is closely related to this study.

CHAPTER 15

Topic:

TECHNOLOGY AND ENHANCEMENT OF EDUCATIONAL MANAGEMENT PRACTICES IN SECONDARY SCHOOLS IN ENUGU STATE

Hereunder are review of theories related to this topic.

Fred Davis' Theory of Technology Acceptance

The Technology Acceptance theory is an information systems theory that models how users come to accept and use a technology. The Theory of Technology Acceptance was propounded by Fred Davis in 1986. The primary objective of the theory was to shed light on the processes underpinning the acceptance of technology, in order to predict the behaviour of and provide a theoretical explanation for the successful implementation of technology. The practical objective of the theory was to inform practitioners about measures that they might take prior to the implementation of systems. Davis embarked on the development of the model of technology acceptance by framing the processes mediating the relationship between external variables and actual system use. The *actual system use* is the end-point where people use the technology. *External variables* such as social influence is an important factor to determine the attitude. When the models are in place, people will have the attitude and intention to use the technology. However, the perception may change depending on age and gender because everyone is different.

The behaviour was represented by Davis as the outcome predicted by perceived usefulness, perceived ease of use and behavioral intention. The theory suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. *Perceived usefulness* (**PU**) was defined by Davis as "the degree to which a person believes that using a particular system would enhance

their job performance". It means whether or not someone perceives that technology could be useful for what they want to do. Davis defined perceived ease-of use (**PEOU**) as "the degree to which a person believes that using a particular system would be free from effort". If the technology is easy to use, then the barrier is conquered. If it's not easy to use and the interface is complicated, no one has a positive attitude towards it. Davis added that Perceived ease of use and perceived usefulness capture the expectations of positive behavioral outcomes and the belief that behaviour will not be labor-consuming. Behavioral intention is a factor that leads people to use the technology.

The behavioral intention (BI) is influenced by the attitude which is the general impression of the technology. Behavioral intention can be substituted by the attitude toward behaviour which is an affective evaluation of the potential consequences of the behaviour. The higher the affective response, the higher is the likelihood that the behaviour will take place. The effect of perceived usefulness on actual use can be direct, which underscores the importance of the variable in predicting behaviour. Although perceived ease of use does not affect user behaviour directly, it underpins the effect of perceived usefulness. There are people who do not use technology or nontechnology users also referred to as individuals who lack skills to use technology. These people do not accept technology mainly for fear of being laid off by technology. Rather than taking up the challenge to acquire technology competences and skills, they settle for criticism and do all within their reach to sabotage technology use. Fred Davis theory of technology acceptance is very relevant to these present study. Davis theory implies that if Technology is expected to be easy to use, the more likely it is that administrators may consider use of technology for enhancing administrative practices in secondary schools.

Technology Acceptance is a topical issue in Educational sector especially now that we are in the jet age where digitalization is trending. As a result, Technology for Educational administrative practices must be designed to facilitate the users' perceived usefulness as well as users' perceived ease-of use which will ultimately determine users' acceptance of Technology. Fred Davis'

Theory of Technology Acceptance addressed motivation of technology users' value for Technology through insuring that users' needs and expectations are met. However, the theory failed to address the issue of human relations which is very vital for effective administration in secondary schools. This gap necessitates the review of George Elton Mayo's Theory of Human Relations.

George Elton Mayo's Theory of Human Relations

The Human Relations Theory was propounded by an Australian born psychologist, industrial researcher and organizational theorist, George Elton Mayo, commonly called Elton Mayo in 1933 in Australia. The human relations theory drew much of its inspiration from the famous Hawthorne investigations (1927-32). The human relations approach to management places much emphasis on the importance of morale and informal social relationship as determinants of organizational effectiveness. This theory had an immediate appeal for welfare workers and all those who were against dehumanization of the workers. Elton Mayo used socio-psychological techniques to solve known management problems, and this has since led to such other techniques as the counseling programmes, which is now popular in many industries. Based on the Hawthrone experiment, mayo came out with the following finding:

1) Setting of the level of production capacity by social norms contrary to the belief of the classics, particularly because workers preferred to belong to social group.
2) The group established production quotas, and the group norms ensure that no one deviates from the established quota.
3) The amount of work carried out by a worker is determined not by his physical capacity but his social capacity, and that non-economic rewards are most important in the motivation and satisfaction of workers, who react to their work situation as group and not as individual.

4) That a leader is not necessarily the person appropriated to be in charge; informal leaders (king-makers) can develop who have more powers.
5) That an effective supervisor is that who regards his job as dealing with human being rather than the task.
6) That good and effective communication and participation in decision making are some of the most significant rewards which can be offered to obtain the commitment of the employee in any organization.

Mayo further observed that workers should be sufficiently involved in decisions that will affect them.

In response to the classics, Mayo did not believe that materialistic goals are the only motivation force. Mayo did not believe too, that authoritarian leadership is meant to get the lazy employee to work. Mayo believed that a highly specialized task is meant to down grade the worker. As a consequence, Mayo recommended that what is desired, is for a worker to produce (all by himself) a set of tasks. That is challenging and, therefore motivational. Speaking on humanistic organization, mayo recommended that organizations, must aid the creation and maintenance of stable, effective working groups since participation in small groups is a fundamental desire. Incidentally, this is the major goal of educational administrative practices such as planning, staff development, staff welfare, supervision of instructional procedures and enforcement of discipline. All these practices must be executed with human face so as to maintain cordial human relations. This can be achieved through the use of technology in enhancing various educational administrative practices.

Therefore, George Elton Mayo's Theory of Human Relations is very useful for this study. One of the gain of technology, in today's world, undoubtedly is enhancement of human relations. Infact, it has been said that lack of communication or miscommunication or communication gap is the worst enemy of human relations. Hence, healthy human relatives, can be facilitated by efficient technology integration into administrative practices. Fred Davis and George Elton Mayo sufficiently expounded the need

for technology acceptance and the vital position of harmonious human relations in organizations. Yet, both theories ignored the leaders' ability to influence or motivate their workers' goal attainment. Thus, the need for Robert House's Path Goal Theory of Leadership.

Robert House's Path Goal Theory of Leadership

The Path Goal Theory was propounded by Robert House in 1971 and Revised in 1996 in America. According to House, the effectiveness or success of leaders depends, to a very great extent on their ability to impact on their subordinates' motivation. Hence, leaders are people who can influence other people to do what they (leaders) desire, the way and time they want it done. According to House, the path goal theory is based on the belief that leaders can actually influence or motivate their workers' goal attainment. The major concern of the theory is how the leader influences the subordinates' perception of their work goal, personal goals and paths to the attainment of the goals. The theory suggests that a leader's behaviors is motivating or satisfying to the degree that the behavior increase subordinate goal attainment and clarified the paths to their goals. Path goal theory not only suggests what type of style may be most effective in a given situation, it also attempts to explain why it is most effective.

Notably, people are satisfied with their job if they think it leads to things that are highly valued and they work hard if they believe that effort leads to things that are highly valued. The first proposition of the path-goal theory is that leader behavior is acceptable and satisfying to subordinates to the extent that subordinates see such behavior as either an immediate source of satisfaction or as instrumental to further satisfaction. The second proposition of this theory is that the leaders' behavior will be motivational, that is, increase effort, to the extent that (1) such behavior makes satisfaction of subordinates need contingent on effective performance and (2) such behavior complements the environment of subordinates by providing for coaching, guidance, support and rewards necessary for effective performance. These two propositions suggest that the leader's strategic functions are to

enhance subordinates' motivation to perform, satisfaction with the job and acceptance of the leader. The theory is concerned with different leadership behaviors like directive, supportive, achievement oriented, and participative leadership.

Leader directiveness has a positive correlation with satisfaction and expectancies of subordinates who are engaged in ambiguous tasks and has a negative correlation with satisfaction and expectancies of subordinates engaged in clear tasks. The theory hypothesizes that supportive leadership will have its most positive effect on subordinates satisfaction for subordinates who work on stressful, frustrating or dissatisfying tasks. The theory also suggest that achievement oriented leadership will cause subordinates to strive for higher standards of performance and to have more confidence in the ability to meet challenging goals. Principals and other secondary schools administrators are expected to act as leaders in the school. No doubt, the primary function of a leader is to identify the essential purpose or mission of an organization and the strategy for attaining it. Leadership is about seeking adaptive and constructive change. The change in today's world of leadership is transformation from analog to digitalization. One cannot talk of digitalization without technology. Hence, principals must seek adaptive and constructive technology that would enhance their administrative practices so as to attain the goals of secondary schools.

CHAPTER 16

Topic:

EFFECT OF USE OF CHATBOTS ON ACADEMIC ACHIEVEMENT AND RETENTION OF SECONDARY SCHOOL STUDENTS IN COMPUTER STUDIES IN ENUGU STATE

Hereunder are review of theories related to this topic.

Bruner's Theory of Cognitive Development

Jerome Bruner an American great psychologist made interesting and significant contributions to the course of intellectual development including propounding his theory of Cognitive Development in 1971. Bruner' emphasized addition to cognitive structure which a child acquires as he moves from the enactive mode to iconic mode and to the symbolic mode. In this theory, Bruner argued that as a child develops, he passes through three modes or ways of representing his world- the enactive mode, iconic mode and symbolic mode. The enactive mode is the mode of representing the world by an infant depends on action. The infant demonstrates that by his capacity to move around to reach and to grasp. He pairs actions with objects. This provides him the foundation for more complex modes of representing the world later which depends less on immediate stimuli. He manipulates materials directly.

At the iconic mode, the child focuses on the surface features of objects so as to form images of them. He can produce an experience through the use of images, but these are not related. Memories of visual experience are restricted to the concrete and specific situations (i.e. he deals with mental images of objects but does not manipulate them directly). The symbolic mode represents the highest level of abstraction that can be achieved in representing experiences. Symbols are used in representing an object and such symbols point to deeper meanings that are not immediately apparent

on the surface. Bruner indicates that symbolization is the process of attributing names to objects. The most important symbolic activity at this stage is language which can transform the manner in which a child adapts to his environment. With the help of language, a child able to reason in logical fashion, solve complex problems and analyze possible options or alternatives in many and varied situations. In other words, the child is strictly manipulating symbols and no longer mental images of objects.

These characteristics of reasoning in logical fashion, solving complex problems and analyzing possible options or alternatives also characterize the use of Chatbots for instructional purposes. Bruner's Cognitive Development theory can be further linked to use of Chatbots in teaching and learning of computer studies in four major ways, namely; discovery, intuition, translation and readiness.

- **Discovery**

Discovery is an approach where it becomes necessary that the learner finds out things himself. Bruner remarked that after ten years of experimentation, an average computer teacher can go a long way in helping his students in discovering ideas for themselves. Every teacher has his own tricks and approaches to stimulate discovery in the student. Some of these may include the use of a socratic method, the questioning method, the devising of particularly apt computation problems that can allow a student to find out facts, the act of stimulating, the act of stimulating the students to shortcuts through which he discovers certain interesting algorithms of himself, the projection of an attitude of interest that are daring and exciting and activity approach. Burner indicated that discovery should be better defined not as product discovered but as a process of working and the method of discovery should have as its principle virtue, the encouragement of such process of working.

- **Intuition**

According to Bruner, intuition is "the act of grasping the meaning and significance or structure of a problem without explicit reliance on the analytic apparatus of one's craft". Intuition helps in yielding hypotheses quickly which produces interesting combination of ideas

before their work is known. Intuition precedes proof. The techniques of analysis and proof are designed to test and check intuition. Scientific intuition requires the embodiment or concretization of an idea, not yet stated in the form of some sort of operation or example.

- **Translation**

Providing the means for helping a child to improve on his intuition is regarded as translation. There are three kinds of translation-the problem of structure, sequence and embodiment.

a. The Problem of Structure

In an attempt to transmit the computer teacher's understanding to his students, the problem of finding the language and ideas which the students would be able to use if they were attempting to explain the same thing arise. Therefore, the computer teacher is confronted with the problem of determining a homologue that will contain his own idea moderately well and to get it across to the students without too much loss of precision, at least in a form which will allow us to communicate further sometimes in future.

b. The Problem of Sequence

A computer teacher can illustrate sequence using Chatbots by getting his students to progress from their present two-value logic of things that exist and those which do not exist to subtler understanding of the matter. Bruner posited that there exist important steps or sequences in the mastery of a concept. For students to comprehend the idea of serial ordering, they must first have a firm understanding of the idea of comparison- that one thing includes another or is larger than other.

c. The Problem of Embodiment

The problem of embodiment is concerned with the question: how does a computer teacher embody illustratively the middle possibility of something which does not quite exist as a clear and observable datum? This problem, which is abstract in nature, exists in computer studies.

- **Readiness**

Bruner defines readiness as "a function not so much of maturation which is not to say that maturation is not important but rather of our intention and our skill at translation of ideas into the language and concepts of the age we are teaching". Before a computer teacher decides what should be taught to his students of any age, there is need for him to make plain his objectives. These objectives help in making rapid strides ahead in solving the problem of readiness. The problem of translating concepts from one level or the other can be solved once the teacher decides on what he wants to translate. The entry behavior test of every lesson plan for each topic illustrates clearly the concept of readiness.

Cognitive development is very important in the learning of computer studies. It is only when learners' cognitive development is successful that they (learners) will achieve higher in subjects such as computer studies. Hence, it is established that Bruner's theory of cognitive development is consistent with this study. As useful as Bruner's theory of cognitive development is to this study, Bruner could not portray use of Chatbots as a problem solving activity. To bridge this gap, the researcher reviewed Wertheimer's Theory of Problem Solving.

Wertheimer's Theory of Problem Solving

Wertheimer Theory of Problem Solving was propounded by Max Wertheimer in 1922. The theory posits that problem solving occurs with a flash of insight. According to Wertheimer, insight occurs when a problem solver moves from a problem to a solution. During insight, problem solvers devise a way of representing the problem that enables solution. Wertheimer psychologists offered several ways of conceptualizing what happens during insight: insight involves building a schema in which all the parts fit together, insight involves suddenly reorganizing the visual information so it fit together to solve the problem, insight involves restating a problem's givens or problem goal in a new way that makes the problem easier to solve, insight involves removing mental blocks, and insight involves finding a problem analog (i.e., a similar problem that the problem solver already knows how to solve). All

these attributes of insight are found in use of Chatbots as instructional aid. This is because use of Chatbots encourages ideating many solutions (possible or impossible) and then using acquired skills to prefer and realize the best solution. Wertheimer theory therefore is consistent with this study since it takes insight to use Chatbots effectively for instruction. As a matter of fact, use of Chatbots is a problem solving activity.

CHAPTER 17

Topic:

PRINCIPALS' MANAGERIAL PRACTICES AS DETERMINANT OF TEACHER PRODUCTIVITY IN SECONDARY SCHOOLS IN ENUGU STATE, NIGERIA

Hereunder are review of theories related to this topic.

The Human Relations Theory

The Human Relations Theory was propounded by an Australian born psychologist, industrial researcher and organizational theorist, George Elton Mayo, commonly called Elton Mayo in 1933 in Australia. The human relations theory drew much of its inspiration from the famous Hawthorne investigations (1927-32). The human relations approach to personnel management places much emphasis on the importance of morale and informal social relationship as determinants of organizational effectiveness. This theory had an immediate appeal for welfare workers and all those who were against dehumanization of the workers. Elton Mayo used socio-psychological techniques to solve known management problems, and this has since led to such other techniques as the counseling programmers, which is now popular in many industries. Based on the Hawthrone experiment, mayo came out with the following findings:

1) Setting of the level of production capacity by social norms contrary to the belief of the classics, particularly because workers preferred to belong to social group.
2) The group established production quotas, and the group norms ensure that no one deviates from the established quota.

3) The amount of work carried out by a worker is determined not by his physical capacity but his social capacity, and that non-economic rewards are most important in the motivation and satisfaction of workers, who react to their work situation as group and not as individual.
4) That a leader is not necessarily the person appropriated to be in charge; informal leaders (king-makers) can develop who have more powers.
5) That an effective supervisor is that who regards his job as dealing with human being rather than the task.
6) That good and effective communication and participation in decision making are some of the most significant rewards which can be offered to obtain the commitment of the employee in any organization.

Mayo further observed that workers should be sufficiently involved in decisions that will affect them. In response to the classics, he maintained that he did not believe that materialistic goals are the only motivation force. He did not believe too, that authoritarian leadership is meant to get the lazy employee to work. He also believed that a highly specialized task is meant to down grade the worker. As a consequence, what is desired, he recommended, is for a worker to produce (all by himself) a set of tasks. That is challenging and, therefore motivational. Speaking on humanistic organization, mayo recommended that organizations, must aid the creation and maintenance of stable, effective working groups since participation in small groups is a fundamental desire. Elton Mayo's theory of human relations is very relevant to this study especially as mayo placed much emphasis on the importance of morale and social relationship as determinants of organizational effectiveness. Hence, principals' managerial functions will elicit teacher productivity (organizational effectiveness) if accompanied with morale boosters and cordial formal and informal relationships. On the other hand, Mayo's theory failed to address leaders ability to influence their workers perception of organizational goals, personal goals and paths to the attainment of these goals. This necessitated the review of the path goal theory presented in the next section.

The Path Goal Theory of Leadership

The Path Goal Theory was propounded by Robert House in 1971 and Revised in 1996 in America. According to House (1996), the effectiveness or success of leaders depends, to a very great extent on their ability to impact on their subordinates' motivation. Hence, leaders are people who can influence other people to do what they (leaders) desire, the way and time they want it done. According to House, the path goal theory is based on the belief that leaders can actually influence or motivate their workers' goal attainment. The major concern of the theory is how the leader influences the subordinates' perception of their work goal, personal goals and paths to the attainment of the goals). The theory suggests that a leader's behaviours is motivating or satisfying to the degree that the behaviour increase subordinate goal attainment and clarified the paths to their goals.

House added that path goal theory not only suggests what type of style may be most effective in a given situation, it also attempts to explain why it is most effective. The path-goal approach has its roots in a more general motivational theory called expectancy theory. Briefly, expectancy theory states that an individual's attitude (e.g. Satisfaction with supervision or job satisfaction) can be predicted from; (1) the degree to which the job, or behaviour, is seen as leading to various outcome (expectancy) and (2) the evaluation of these outcomes (valences). Thus, people are satisfied with their job if they think it leads to things that are highly valued and they work hard if they believe that effort leads to things that are highly valued.

The first proposition of the path-goal theory is that leader behaviour is acceptable and satisfying to subordinates to the extent that subordinates see such behaviour as either an immediate source of satisfaction or as instrumental to further satisfaction. The second proposition of this theory is that the leaders' behaviour is motivational, i.e. increase effort, to the extent that (1) such behaviour makes satisfaction of subordinates need contingent on effective performance and (2) such behaviour complements the environment of subordinates by providing for coaching, guidance, support and rewards necessary for effective performance. These two

propositions suggest that the leader's strategic functions are to enhance subordinates' motivation to perform, satisfaction with the job and acceptance of the leader. They talk about different leadership behaviours like directive, supportive, achievement oriented, and participative leadership.

Leader defectiveness has a positive correlation with satisfaction and expectancies of subordinates who are engaged in ambiguous tasks and has a negative correlation with satisfaction and expectancies of subordinates engaged in clear tasks. The theory hypothesizes that supportive leadership will have its most positive effect on subordinates satisfaction for subordinates who work on stressful, frustrating or dissatisfying tasks. The theory also suggest that achievement oriented leadership will cause subordinates to strive for higher standards of performance and to have more confidence in the ability to meet challenging goals.

The school principal is expected to act as a leader in the school. The success of a school to accomplish the goal depends upon the ability of the head to lead staff members. Kotter (2005) held that the primary function of a leader is to identify the essential purpose or mission of an organization and the strategy for attaining it. Leadership is about seeking adaptive and constructive change. When principals are involved in influencing a group to meet its goals, they are involved in leadership. When leaders are involved in planning, organization, staffing, and controlling, they are involved in administration. All these process involves influencing a group of individuals towards goal attainment.

Evidently, one of the ways of influencing the staff members to attain set objectives or goals is to motivate them through effective managerial practices. Application of staff recruitment and selection, staff training and development and staff welfare will bring about the right kind of atmosphere that will assure the staff that management has their interests at heart. The multiplier effect in harmony, dedication to duty and attainment of the goals of the organization. This is fully supported by the human relations and theory as well as the path goal theory of leadership.

CHAPTER 18

Topic:

EFFECTS OF COMPUTER AIDED INSTRUCTION ON SECONDARY SCHOOL STUDENTS' INTEREST, ACADEMIC ACHIEVEMENT AND RETENTION IN COMPUTER STUDIES IN ENUGU STATE

Hereunder are review of theories related to this topic.

Piaget's Cognitive Development Stage Theory

Jean Piaget propounded the cognitive development stage theory in 1936. It is primarily known as a development stage theory but in fact it deals with the nature of knowledge itself and how humans come gradually, to acquire it, construct it, and use it. Piaget posited that cognitive development is at the center of human organism and language is contingent on cognitive development. Below is a description of the stages through which it develops until maturity. These stages of cognitive theory are:

5. Sensory-motor stage 0-2yrs
6. Pre-operational stage 2-7yrs
7. Concrete operational stage 7-11yrs
8. Formal operational stage 11-15yrs

Piaget believed that this process of understanding and changes involves two basic functions Assimilation and accommodation. Assimilation, one of two processes coined by Jean Piaget, described how humans perceive and adapt to new information. It is the process of taking one's environment, and new information and fitting it into pre-existing cognitive schemes. Assimilation occurs when humans are faced with new or unfamiliar information and refer to previously learned information in order to make sense of it. Accommodation, unlike assimilation is the process

of taking one's environment and new information and altering one's preexisting schemes in order to fit in the new information.

Piaget's theory has a major impact on the theory and practice of education. The theory focused attention on the idea of developmentally appropriate education with environment, curriculum, material, and instruction that are suitable for students in terms of their physical and cognitive abilities and their social and emotional needs. Piaget's postulations can be summarized thus;

- A focus on the process of children's thinking, not just its product in checking the correctness of children's answers, teachers must understand the processes children use to get to the answers. Appropriate learning experiences build on children's current level of cognitive functioning and only when teachers appreciate children methods of arriving at particular conclusion are they in a position to provide such experiences.
- Recognition of the crucial role of children's self-initiated active involvement in learning activities. In a Piagetian classroom, the presentation of readymade knowledge is de-emphasized. Knowledge in children are encouraged to discover for themselves through spontaneous interaction, teachers provide a rich variety of activities that permit children to act directly on the physical world. A de-emphasis on practices aimed at making children adult like in their thinking.

Piagetian based educational programs accept his firm belief that premature teaching could be worse than no teaching at all, because it leads to superficial acceptance of adult formulas rather than true cognitive understanding. Piaget's theory assumes that all children go through the same developmental sequence but that they do so at different rates. Therefore, teachers must make a special effort to arrange classroom activities for individuals and small groups of children rather than for the total class group. In addition, individual assessment of children's educational progress should be made in terms of each child's own previous course of development, not in terms of standards provided by the performances of same age peers.

From the theory, it is clear that assimilation and accommodation work hand in hand. For a student to accommodate the fundamentals of Computer Studies in school, what he has, that is, what he/she has assimilated from the domestic homes and environment must agree with the new knowledge.

Formalization of the theory of constructivism is generally attributed to Jean Piaget who articulated mechanisms by which knowledge is internalized by learners. These features characterize the Computer Aided Instruction which shall be used in this work. More-so, the formal operational stage (11-15yrs) of the Piaget's classifications corresponds to the stage of the subjects of this study that is Junior Secondary School Students. Piaget delt extensively with the characteristics of the learners' cognitive development stages and their implications to teaching and learning. However, Piaget failed to emphasize how to elicit meaningful learning as against rote learning. Thus necessitating the review of Ausubel's Subumption theory to fill this gap.

Ausubel's Subsumption Theory

David Ausubel propounded the subsumption theory in 1963. The theory centers on the process of meaningful and Rote learning. Meaningful learning occurs when new knowledge is consciously linked to existing concepts (that is subsumers) the learner already knows. Subsumers will optimize meaningful learning. But where the "subsume" does not exist he recommends the use of what he called "advance organizers". Advance organizer is in the form of introductory material presented in advance of the learning itself to link already known materials to the new materials to be learnt. He uses the term subsumption to suggest how the existing knowledge of the learner interacts with the new knowledge.

In contrast to meaningful learning, rote learning occurs when one acquires new information without specific association with existing concepts in his cognitive structure (that is knowledge store). Ausubel criticized Bruners discovery approach as being too time consuming and insufficient to be considered as a primary method of presenting subject matter. Rather he maintains that if the materials can be meaningfully organized by the instructor, the need for

students' discovery is removed and the process of learning is rendered efficient.

A valuable practical application of Ausubel's theory is for the teacher to tie the new material to what the learner already knows. The teacher can either use such subsumers or carefully developed advance organizer. The organizer can be a question, a demonstration, a definition, an analogy, a film or animated tips in a Computer Aided instruction such as the one designed for this study. Teachers should also employ the practice of alerting their students in advance of what topic that will be treated next and furnish them with the relevant references, bearing in mind its relevant to what the students already know.

Teachers should refrain from the unsound pedagogical practice of withholding information about certain books or other sources of information because they do not want the learners to access them. Ausubel maintained that meaningful learning occurs when new knowledge is consciously (knowingly) linked to existing concepts (that is subsumers) the learner already knows. Meaningful learning therefore, is a cognitive activity and in line with the objectives of Computer Studies such as stimulating creativity, rationality and innovative thinking in the learners. Similarly, it is only meaningful learning that are likely to influence students' interest, academic achievement and retention in a school subject such as Computer Studies.

CHAPTER 19

Topic:

DEPRESSION AND STIGMATIZATION AS PREDICTORS OF MARITALCONFLICT AMONG PARENTS WITH AUTISTIC CHILDREN IN ENUGU STATE

Hereunder are review of theories related to this topic.

Beck's Cognitive Theory of Depression

Beck's cognitive theory of depression was propounded in 1950 by an American Psychiatrist, Aaron Temkin Beck (July 18, 1921 to November 1, 2021). Beck was a Professor in the department of psychiatry at the University of Pennsylvania. He is regarded as the father of cognitive therapy and cognitive behavioral therapy (CBT). Beck's main argument was that depression was instituted by one's view of oneself, instead of one having a negative view of oneself due to depression. This has large social implications of how we as a group perceive each other and relate our dissatisfactions with one another. Thus, an individual's negative views about their future may strongly control their interaction between dysfunctional attitudes and the increase in depressed mood. However, in vulnerable individuals, such depressed mood may be accompanied by a host of other depressive symptoms.

Beck developed an instrument called sociotropy-autonomy scale. The scale was originally meant to identify self-feelings that would lead to depression, mainly solitude/interpersonal insensitivity, independence, and individualistic achievement. However, the experiments showed that the independence did not correlate with depression, and the sociotropy, not autonomy was a precursor of depression. According to Beck, sociotropy can be characterized by an individual's emphasis on interpersonal interactions involving intimacy, sharing, empathy, understanding,

approval, affection, protection, guidance, seeking help, seeking approval from others and trying to avoid disapproval from others as much as possible. Beck seemed to posit that there was a strong correlation with sociotropy and depression which is a trait when relating to underlying thoughts and emotions. This provide support for cognitively caused depression.

Another dimension to Beck's theory is associating depression to dysfunctional beliefs and negative attitudes. Beck held that a person's depressive states is likely to be consistently related to their negative processing of personal information. Since a person's cognitive thoughts seem to be affecting them, they are mostly likely to develop symptoms of depression. A key part of Beck's Theory is not only that the subject will feel negative underlying beliefs, but also that these beliefs fall into a certain field which separates them from other disorders such as panic and anxiety disorders. For example, these include polar reasoning, selective abstraction, and overgeneralization. Such feelings promote failure in the first and last (polar reasoning and overgeneralization) and loss in the second (selective abstraction). Polar reasoning is extreme, so even a slight waiver from perfection is considered failure. Abstraction means that successes are ignored, and lost to the subject, who is left only with sadness. Overgeneralization implies one will do poor at one thing, and assume failure in all related things. Thus, the main feelings of depression according to Beck are failure and loss.

Beck's theory is strongly consistent with this study in many aspects. Beck's main argument which was that depression was instituted by one's view of oneself applies to the theses of this study that parents of autistic children may suffer depression by having a bad view of themselves. This bad view or low self-worth/self-esteem may result from how the parents are treated by people around them simply because they have autistic children. The behaviour of people towards parents of autistic children may also result from another aspect of Beck's theory which posited that depression may result from dysfunctional beliefs and negative attitudes. There is no gain overstressing that autism have been widely misconceived,

misunderstood, misrepresented and misinterpreted by greater percentage of people in an average traditional Nigerian society.

All these lead to discrimination, avoidance and other negative attitudes towards victims of autism and their parents. It is also possible that parents of autistic children may yield to the views of the society about them. As a result, such parent may believe that they are directly or indirectly the causes of their children's disorder. When they have accepted these guilt, then Beck's position that a person's depressive state is likely to be consistently related to their negative processing of personal information will come to play. Beck's theory is relevant to depression which is one of the major independent variables in this study. However, the theory does not address other major variables such as stigmatization and marital conflict. Therefore, the researcher reviewed other theories presented hereunder to fill this gap.

Talcott Parsons Theory of Labeling (1957)

Talcott Parsons theory of labeling was propounded by a renowned American sociologist of the classical tradition, Talcott Parsons in 1957. Talcott Parsons was famous for establishing the department of Social Relations at Harvard University U. S. A. In the theory of labeling, Talcott Parsons described how society comes to label people as deviant. Talcott Parsons held that when someone is labeled, they are treated differently from others who have not been labeled. This treatment can be either positive or negative, depending on the circumstances. According to Parsons, these labels may come in many forms, but the most common types are based on race, ethnicity, religion, gender and even illness or psychological disorder. Talcott Parsons posited that the designation healthy or ill, generally involves social definition by significant others.

Label associated with illness or disorder can reshape or mark people treating/caring for those suffering from the illness or disorder. According to Talcott Parsons, one may know that a person has been labeled when there is a change in their behaviour. For example, a person may act differently around people they know will label them. It is also possible that someone might feel more anxious in an environment where labels are expected or likely to be applied.

Behavioral changes can happen from labeling due to negative connotations associated with the terms or fear that they will be labeled again if they continue their current behavior. A person might also react to labeling by complying with the labeling and changing themselves, which further reinforces the idea of being labeled in society. When someone's identity depends on how others think about them, it becomes difficult for them to act outside of those expectations because no one knows who they are anymore.

Parsons propounded two dimensions to labelling. Firstly, labels may apply to a person who fulfills any number of different identities; secondly, these labels affect behavior. Talcott Parsons' theory of labeling is consistent with this study especially with regard to stigmatization. Stigma is a derogatory social label that radically and negatively affects the ways individuals view themselves and the ways others view the individual as a person. When people place marks or labels on an individual, such individual becomes stigmatized. In other words, stigmatization is negative labeling. In the context of this study, Parsons' theory also relates to this study in area of Autism which is a psychological disorder. This is because Talcott Parsons posited that the most common types of labelling are based on race, ethnicity, religion, gender and even illness or psychological disorder. Summarily, this study draws relevance from Talcott Parsons theory of labelling in two areas namely stigmatization and autism. In an average Nigerian society, not many people understand that autism is a psychological disorder which scientifically has nothing to do with witchcraft, sin or abominable acts. Rather, misconceptions, misinformation and wrong assumptions have overwhelmed the populace on this issue. Consequently, victims of autism as well as parents and those who take care of autistic people are labeled, marked, discriminated against and stigmatized. The two theories revealed above have addressed depression and stigmatization without capturing marital conflict. Hence, the need for the next theory which did justice to the concept of marital conflict.

Murdock's Theory of Marital Conflict (1967)

Murdock's Theory of Marital Conflict was propounded in 1967 by an American Anthropologist, George P. Murdock (11th May 1897 to 29th March 1985). George P. Murdock was a Professor at Yale University and University of Pittsburgh. After so many empirical ethnological studies and famous studies and family and kingship structures across differing cultures, Murdock came up with this theory. Just as functionalists examine the ways in which a particular social institution operates and fulfills important tasks–or functions–for societies, George Murdock in this theory looked at the mechanisms through which these families or marriages reproduce systems of inequality at a macro sociological level. George Murdock posited that the purpose of the family was to perform four crucial functions: the sexual function, reproductive function, educational function and economic function. Hence, families regulate sexual relationship between individuals and offer a socially legitimate sexual outlet for adults. In like manner, the sexual outlet within a family gives way to reproduction, which is a necessary part of ensuring the survival of society.

The family plays a vital role in training children for adult life and as the primary agent of socialization and enculturation, the family teaches young children the ways of thinking and behaving that follow social and cultural norms, values, beliefs, and attitudes. The educational component includes gender roles. Economic roles within the (nuclear) family are related to physical and psychological differences between males and females, with females being better suited to domestic work. However, Murdock argued that these functions of the family or a marriage can be hampered by marital conflict. Within families, Murdock highlighted the role of power in family life and contend that the family is often not a haven, but rather an arena where power struggles occur. This exercise of power often entails the gender role performances described above. Murdock examined domestic violence (spousal and child), sexual assault, marital rape, and incest and theorized how these disproportionate, violent acts against women and girls provide a home for sexism and violence that are seen in society. Murdock

averred that the person with the most access to value resources in the family/marriage held the most power.

In most developing nations, men who work in paid labor outside of the home held more power than women who work inside the home because the men earn money and money is one of the most valuable resources. Marital conflict may take the form disputes over the division of household labor. Household labor offers no wages and, therefore, no power. Murdock submitted that when men do more housework, women experience more satisfaction in their marriages, reducing the incidence of conflict. Other common source of marital discord according to Murdock are those that involve inequalities or discrepancies in power and authority. Marriages/families are reflective of the larger social structure. Hence, deliberate care must be taken to make them peaceful. According to Murdock, the family include adults of both sexes at least two of whom maintain a socially approved sexual relationship and one or more children (including any adopted children), which is the traditional definition of a nuclear family.

George Murdock examined the division of labor within a family by distinguishing between instrumental and expressive roles. Instrumental roles typically involve work outside of the family that provides financial support and establishes family status. Expressive roles typically involve work inside of the family which provides emotional support and physical care for children. In many societies, males assume the instrumental role and females assume the expressive role; however, as the structure of the family has changed over time, along with changing values and norms related to gender identity, these roles are not so easily categorized by gender. Murdock's heterosexual nuclear family, ensures that families are well balanced and coordinated. When family members move outside of these roles, the family is thrown out of balance and must recalibrate in order to function properly. For example, if the father assumes an expressive role such as providing daytime care for the children, the mother must take on an instrumental role such as gaining paid employment outside of the home in order for the family to maintain balance and function. Else, marital conflict will ensue.

Murdock's theory of marital conflict is very consistent with the concept of marital conflict in the context of this study. Specifically, Murdock's theory addressed all the indices of marital conflict articulated in this study. The indices include: parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict and marital sex related conflict. Furthermore, the ideas that gave rise to items of the questionnaire on marital conflict used in this study were fully covered in the explanation of Murdock's marital conflict theory.

CHAPTER 20

Topic:

PROBLEM-SOLVING ABILITIES AS DETERMINANTS OF SECONDARY SCHOOL STUDENTS' ACHIEVEMENT AND RETENTION IN ALGEBRA IN ENUGU STATE

Hereunder are review of theories related to this topic.

Wertheimer's Theory of Problem-solving

Wertheimer Theory of Problem-solving was propounded by Max Wertheimer in 1922. The theory posits that problem-solving occurs with a flash of insight. According to Wertheimer insight occurs when a problem solver moves from a problem to a solution. During insight, problem solvers acquire and use problem-solving ability to represent the problem that enables solution. Wertheimer psychologists offered several ways of conceptualizing what happens during insight: insight involves building a schema in which all the parts fit together, insight involves suddenly reorganizing the visual information so it fit together to solve the problem, insight involves restating a problem's givens or problem goal in a new way that makes the problem easier to solve, insight involves removing mental blocks, and insight involves finding a problem analog (i.e., a similar problem that the problem solver already knows how to solve). Wertheimer theory informs educational programmes aimed at teaching students how to represent problems, thus this learning theory is closely linked with the problem-solving abilities chosen for this study.

Newell's Information Processing Theory of Problem-solving

The information processing theory of problem-solving was postulated by Allen Newell in 1975. The theory is based on a human computer metaphor in which problem-solving involves carrying out a series of mental computation on mental representations. The key

components in the theory are as follows: the idea that a problem can be represented in simpler forms. These simper forms could be questions whose answers will lead to solution of original complex problem. The problem begins in the given state; the problem solver applies an operator that generates a new state and so on until the goal state is reached. For example, a common search heuristic is means-ends analysis, in which the problem solver current goal; if there is a constraint that blocks the application of the operator, then a goal is set to remove the constraints, and so on. Information processing theory relates to educational programs aimed at teaching learners how to solve problems.

Allen Newell made the classic distinction between learning by rote and learning by understanding. For example, in teaching students how to compute the area of a parallelogram by a rote method, students are shown how to measure the height, how to measure the base and how to multiply height times base using the formula, area = height x base. According to Allen Newell, this rote method of instruction leads to good performance on retention tests (i.e solving similar problems) and poor performance on transfer tests (i.e solving new problems). In contrast, learning by understanding involves helping students see that if they can cut off the triangle from one end of the parallelogram and place it on the other side to form a rectangle; then, they can put 1 x 1 squares over the surface of the rectangle to determine how many squares form the area. The meaningful method of instruction leads to good retention and good transfer performance. Allen Newell claimed that rote instruction creates reproductive thinking-applying already learned procedures to a problem-whereas meaningful instruction leads to productive thinking. This helps the learner to adapt what was taught to new kinds of problems.

Allen Newell identified instructional methods that are intended to promote meaningful learning, such as providing advance organizers that prime appropriate prior knowledge during learning, asking learners to explain aloud a test they are reading, presenting worked out examples along with commentary or providing hints and guidance as students work on an example problem. From all of the above, one can deduce that a major goal of meaningful methods of

instruction is to promote problem-solving ability transfer, that is, the ability to apply what was learnt in new situations. Abilities needed for this, obviously include brainstorming, divide and conquer, lateral thinking and reduction. Consequently, the Gestalt and information processing theories of problem-solving are relevant for this study.

CHAPTER 21

Topic:

COUNSELING STRATEGIES ADOPTED BY SECONDARY SCHOOL PRINCIPALS FOR CONFLICT MANAGEMENT IN SECONDARY SCHOOLS IN ENUGU STATE

Hereunder are review of theories related to this topic.

Maslow Theory of Conflict

Maslow-theory was propounded by Darby (2003). The theory stated that power comes in many forms: economic, political, military, even cultural. The common assumption of Maslow theory is but the roots of conflict stem from group competition and the purest of power and resources. These assumptions operate on conscious motivational factors in a material oriented environment. The theory capitalizes on observations of group phenomenon for single events in order to study the problem in-depth and to determine their importance and relationships of many variables rather than using far variables for many cases.

Maslow theory has often been occupied with the exercise of power and the use of force, in intergroup relations. The theory is useful in explaining acts and events. Macro conflict theory is useful in explaining conflict behaviour in schools. It illustrates the depth and complexity of emotions that are at work in the school. All these are basic components of industrial relations in a school setting. In most cases it is improper management of industrial relations that gives rise to conflict.

Human Needs Theory

Human Needs Theory (HNT) was developed by Burton (2000) as a generic or holistic theory of human behavior. It is based on the hypothesis that humans have basic needs that have to be met in order to maintain stable societies. He believed that the human

participants in conflict situations are compulsively struggling in their respective institutional environments at all social levels to satisfy primordial and universal needs such as security, identity, recognition and development. They strive increasingly to gain the control of their environment that is necessary to ensure the satisfaction of these needs. This straggle cannot be curbed; it is primordial.

This struggle for primordia needs is theoretically related to the Frustration-Aggression theory which is based on the stimulus-response hypothesis. The frustration of not satisfying these needs leads to aggression and subsequently conflict. What distinguishes Humans Needs Theory from Frustration-Aggression Theory is that the former is concerned only with absolute requirements (needs) while the latter is also concerned with wants and desires. Burton further stated that there are fundamental universal values or human needs that must be met if societies are to be stable. He, therefore, posited that unless identity needs are met in multi-ethic societies, unless in every social system there is distributive justice, a sense of control and prospects for the pursuit of all other human societal developmental needs, instability and conflict are inevitable.

The significance of this theory is that it recognizes and legitimizes both teachers and principals in secondary schools. The needs of both (teachers and principals) must be meet. The needs of one should not be meet at the expense of the other. This helps to move the conflict from zero-sum to win-win. The abstraction of 'hi. man needs' helps to eliminate the sense of mutually exclusive or gained at the expense of another; they are universal. The main thrust of the theory is that if there are certain human needs that are required for human development and social instability, then the solution to conflict must be the ability to create an environment in which these needs can be met by all segments of societies, that is bringing about cordial industrial relations.

Conflict Resolution Theory

Management is 'by alternative dispute resolution skills' and can confine or limit conflict, settlement is 'by authoritative and legal processes' and can be imposed by elites. Borrony (2005) suggested

by contrast conflict resolution means terminating conflict by methods that are analytical and that get to the root of the problem. Conflict resolution is opposed to mere management or 'settlement', points to an outcome that, in the view of the parties involved, is a permanent solution to a problem. These theories are related this study because when industrial relation is managed properly via effective and efficient strategies, conflict are not likely to arise. Occasionally, conflict may arise when there is good relationship. Hence, ability to resolve such conflict amicably results in good industrial relations. Consequently, conflict resolution strategy may have likened to good industrial relations management strategy. Even when conflict resolution strategy differs from industrial relations management strategy, they complement one another.

Client centered theory

The person-centered theory according to the work of Cal Rogers (1902 – 1987) was designed to promote openness, growth and change in understanding the counseling processes. It is an approach which is practical and helpful in education because it can solve some of the problems faced by students. The person-centered theory is a process of helping clients discover new and more satisfying personal meaning about themselves and the world they inhabit. Under this approach the counsellor reassures, encourages, supports the clients so that the client can make his own decision. The most outstanding quality of the counseling relationship is the establishment of empathy, unconditional positive regard, warmth, permissive and accepting and creating climate which permits students to explore their self-structure in relation to tier unique experience Egbo (2013).

This approach is more concerned with the counsellor functioning with open mindedness. Roger notes that growth occurs in an acceptance, warm, empathetic, nonjudgmental environment that gives the students freedom to explore their thoughts, feeling and to solve their own problems. This theory is related to this research work because it reveals all the important counseling relationship that must exist between the counsellor and the student(s), it assures counselors that, with right attitude and proper mind set for greater

output, such counsellor can be of greater help to many students who have made up their minds that they are good for nothing ones, labor feeling of failure in academic and have low self-esteem. This theory is related to this study because it encourages students or any client that the teacher counsellor should also help the student(s) set goals and allow positive self-recognition after attaining set goals and aspiration that will boost success not only in their academic performance but in all aspects of their lives. School counsellor(s) is ever ready to help them, encourage, counsel, inform, educate and discover themselves and become a better and useful person not just for his/her self but to the society at large. This theory is also related to this study because it addresses a process of helping clients discover new and more satisfying personal meaning about themselves and the world they inhabit. No doubt, this is a principal guidance service.

Social Control Theory of Hirchi

Social control theory was propounded by Hirchi (1960). Social control theory refers to the societal and political mechanisms or process that regulate individuals and group behaviors, leading to conformity and compliance to the rules of a given society, state or social group. Hirchi,2002. According to the theorist he believes that exploiting the processes of socialization and social learning builds self-control and reduces the inclination to indulge in any bad behaviour. The theory stipulates that ties or bonds which lead students in conformity to family, school and other aspects of societal beliefs serve to diminish students' propensity for deviant behaviour. The theorist believes that anti-social behaviour occurs only when such bonds are weakened or are not established. Thus, if moral codes are internalized and individuals are tied to and have a stake in their wider community they will voluntarily limit their propensity to commit deviant acts.

In socialization, this formation of bond between individual and the society comprises of four elements which are attachment, commitment, involvement and beliefs. Attachment refers to the effective ties which the students form with significant others like parents, teachers among others who tend to present among others

optimal conformity to socially accepted behaviour. Commitment refers to the aspiration or goals which an individual set for self. Students with well-defined goals tend to minimize propensity for delinquent behaviour because they consider that they have much to lose as opposed to their counterparts who engage in drinking, smoking, dating and involving in criminal act. Beliefs are the extent to which an individual accepts the moral values of the society. And the extent to which an individual accepts this moral values determine the individual's propensity for delinquent behaviour. One of the key elements for social control is developing the individual's bond to conventional society through involvement in conventional activities (that is homework and family activities). This theory posits that trends in increased crime rates are related to a greater dispersion of daily activities with peers, away from parental/guidance supervision and providing the opportunity for delinquency.

In line with this study, students that conform to the rules established by the significant others like, guidance and counselors, parents, teachers, peers and the likes which make them to be acceptable in the society will reduce his propensity to deviant behaviour which eventually enhance his or her academic performance. However, a student could experience rejection from his or her peers and also compelled by them to conform against his or her wish. This type of treatment could make him or her to lose his or her identity as a unique person. This may also affect the student time management and performance in school. This explains the relevance of this theory to this study. Any student that follows the counsellor approach towards social control is most unlikely to be a demerit. He will be able to fulfil his life endeavors.

CHAPTER 22

Topic:

TEACHERS' PERCEPTION OF SOCIAL DEVELOPMENT SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED PERFORMANCE IN MATHEMATICS IN ENUGU STATE

Hereunder are review of theories related to this topic.

The Social Learning Theory

Social learning theory focuses on the learning that occurs within a social context. It explains the acquisition of social behaviour and personality pattern. It considers that people learn from one another. Albert Bandura is considered the leading pioneer of this theory. His theory has previously been known as "Social Cognitive Theory" to encompass his further developments of the theory (Boeree, 1998). Bandura believes that cognitive development alone cannot explain changes in behaviour of secondary school students and he believed that learning processes are primarily responsible for student's development. However, he felt strongly that the cognitive abilities of the student affect learning processes. Observational and imitational learning are two major models under the social learning theory.

Observational Learning:

Bandura believed that people learn by observing the behaviours of others and the outcomes of those behaviours. He claimed that student's learning is heavily reliant on observation. Students observe the people around them behaving in various ways. This is illustrated during the famous Bobo doll experiment (Bandura, 1961). According to Stone (2016) in the Bobo doll experiment, Bandura made a film of his student, a young woman, essentially beating up a Bob doll. (A Bobo doll is an inflatable, egg-shape balloon creature weight in the bottom that makes the bob back

up when you knock him down). The woman punched the clawn, shouting "Sockeroo!" she kicked it, sat on it, hit it with a little hammer, and so on shouting various aggressive phrases. Bandura showed his film to groups of kindergartners who liked it a lot. They then were let out to play. In the playroom, were several observers with pens and clipboards in hand, a brand new Bobo dolls, and a few little hammers. A lot of the kids beat the daylights out of the bob doll. They punched it and shouted Sockeroo", kicked it, sat on it, hit it with the little hammers and so on. In other words, they learnt to do those things the lady in the film did and quite precisely at that by observation. Albert Bandura believed that aggression is learned through a process called behaviour modeling. Individuals that are observed are called models. He believed that individuals do not actually inherit violent tendencies, he argued that individuals, especially students learn aggressive responses from observing others. Who do students and adolescent observe and model themselves on? In society, secondary school students are summoned by many influential models initially teachers and sibling within the family and eventually friends within their peer group, teachers, and TV characters even cartoon characters. These models provide examples of behaviour to observe and imitate. Eg masculine and feminine, pro and anti-social behaviour etc.

Secondary school students pay attention to some of these people (models) and encode their behaviour. At a later time, they may imitate (i.e. copy) the behaviour they have observed, the imitation may be direct imitation or model imitation. The student is likely to attend to and imitate those people it perceives as similar to herself. Consequently, it is more likely to imitate behaviour modeled by people of the same sex. The people around the student respond to the behaviour he/she imitates with either reinforcement or punishment. If the consequences are rewarding, the student is likely to continue performing the behaviour. If teacher sees a little girl consoling her teddy bear and says "what a kind of girl you are" this is rewarding for the student and makes it more likely that she will repeat the behavior. Her behaviour has been reinforced that is strengthened.

Reinforcement can be external or internal and can be positive or negative. If a student wants approved of is an internal reinforcement, a student will behave in a way which it believes will earn approval. Reinforcement is an important factor which usually lead to a change in a person's behaviour. Major factors influencing imitation of observed behaviour include; appropriateness, relevance, similarity, friendliness, powerfulness. Consistency and reward. Students also learn by observing the consequences of another person's (i.e. models) behaviour. The student takes note and copy someone's actions/behaviour. E.g a younger sister observing an older sister being rewarded for a particular behaviour is more likely to repeat that behaviour herself. This is known as vicarious reinforcement. A student who observes a model being punished for a behaviour is less likely to produce the behaviour because of this observation. This is known as vicarious punishment. This relates to attachment to specific models that possess qualities seen as rewarding. The motivation to identify with a particular model is that they have qualities which the individual would like to possess. Identification occurs with a model and involves taking on adopting observed behaviours, values, beliefs and attitudes of the person with whom you are identifying. Identification is different to imitation as it may involve a number of behaviours being adopted whereas imitation usually involves copying a single behaviour.

According to Al-Jaradeen (2016), individuals do not automatically observe the behaviour of a model and imitate it. There is some thoughts prior to imitation and this consideration is called meditational process. This occurs between observing the behaviour the behaviour and imitating it or not. These four meditational processes proposed by Bandura (1977) are, attention, retention, reproduction and motivation. Based on this observational and imitational learning of social learning theory, teachers' perception of their students or in adopting a particular teaching style for their students should bear in mind that any desirable behaviour of character they desire to see in them must be model by term. If they want their student to be cheerful, socially responsible, achievement oriented, pleasant to be up to self reliant and cooperative with others to freely speak his/her mind and takes into consideration others

feelings, they must therefore model these characters/behaviours. A student who sees her teachers being kind, caring, polite and honest will tend to be the same, however, the student who has seen problems being faced with violence, arguments occurring, yelling to show disapproval, exploding in anger will also observe and will likely produce such behaviours. This agrees with Grusee et al (1978) who found that telling students to be generous made no difference, showing generosity did make a difference though. This is evidence that "do as I say not as I do" will not work in teaching.

Also, teachers can use positive social reinforcements such as expressing love for desirable behaviour exhibited by the adolescent and using rewards such as nice statements, as good, that's nice, excellent, am proud of you or even smiles to encourage and strengthen the desirable behaviour they see in their adolescent. They can as well stamp out undesirable behaviour using some negative ones such as sigh, frown, a shake of head, scolding or ignoring. This is called negative reinforcement. Negative reinforcement is so important in students' performance in mathematics because teachers are not the only models the students have. They use it to stamp out any behaviour they might observe and imitate from other models. Teachers should try as much as possible to motivate their students to identify with them. Teachers can as well use vicarious reinforcement and vicarious punishment to encourage and discourage behaviours respectively in their schools.

Theory of Psychosocial Development

Erikson (1963) proposed a psychosocial theory of social development. The theory attempted to explain how society and culture present challenges that shape the individual as he matures. According to Stone (2016), psychosocial development refers to changes in one interactions with others, and ones understanding of others and of oneself and others as members of the society. Erikson had proposed that developmental changes occurring throughout one's life may be perceived as a series of eight stages, with each stage focused on a development task, a crisis, challenge or turning point in one's life span.

According to Al-Jaradeen (2016) during each stage, the person experiences a psychosocial crisis which could have a positive or negative outcome. Erickson's ideas were greatly influenced by Freud; however, while Freud was id psychologist, Erikson was an ego psychologist. He emphasized the role of culture and society and the conflicts that can take place within the ego itself. According to Erickson (1963), the ego develops as it successfully resolves crises that are distinctly social in nature. This involves establishing a sense of trust in others, developing a sense of identity in society, and helping the next generation prepare for the future. He focuses on the Adaptative and creative characteristics of the ego, he was also interested in how students socialize and how this affects their science of self. Erikson (1959) theory of psychosocial development has eight distinct stages, taking in four stages up to the age of 18 years and three further stages beyond, well into adulthood. Erikson suggests that there is still plenty of room for continued growth development throughout one's life. Erikson put a great deal of emphasis on the students period, feeling it was a crucial stage for developing a person's identity. According to Al-Jaradeen (2016), the crisis Erikson assumes occurs at each stage are of a psychosocial nature because they involve psychological needs of the individual (i.e psycho) conflicting with the needs of the society (i.e social).

This theory argues that successful completion of each stage results in a health personality and the acquisition of basic virtues. Basic virtues are characteristics strengths which the ego can use to resolve subsequent crises. Failure to successfully complete further stages and therefore a more unhealthy personality and sense of self. These stages, however, can be resolved successfully at a later time. Based on this theory, the teachers should know and understand these stages. The teacher should be able to adopt a teaching style which will be able to guide the students through this stage ensuring that the developmental tasks, crisis or challenge are being successfully resolved as this will build the basic virtues that are characterized with strength which the ego can use to resolve subsequent crises this making the adolescent socially responsible and self-reliant.

CLUSTER III

EMPIRICAL STUDIES

CHAPTER 23

Topic:

EFFECT OF AUDIO ANIMAION INSTRUCTURAL MEDIA ON MIDDLE BASIC EDUCATION PUPILS' ACHIEVEMENT AND INTEREST IN ENGLISH LANGUAGE IN AGBANI EDUCATION ZONE

Here are reviews of some empirical works related to this topic

Studies on Pupils' Achievement in Literacy

Julius (2015) investigated the Effect of Audio Animation Instructional media on pupil's achievement in Literacy in Scotland. Julius sampled four schools, two in an urban city, and the other two in a rural community all in Scotland. Eight non-equivalent intact classes drawn from the four schools (two urban and two rural) were used. From these classes, Julius drew a sample of 430 pupils through proportionate and simple random sampling techniques. Julius interest was to determine if there existed significant difference between the achievement of the learners with regard to the location of their schools and the strategies used in teaching them. Quasi experimental research design was adopted for the study. Six research questions and six hypotheses guided the study. A 30-item Literacy Achievement Test (LAT) constructed by the researcher was used for data collection. LAT was validated by five research experts and was used to obtain the achievement scores of the pupils. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses.

Major findings of the study indicated that pupils taught the selected literacy topics with Audio Animation Instructional media achieved higher than their counterparts taught same topics with expository method. Location of schools had significant effect on pupils' achievement in literacy when taught with Audio Animation Instructional media in favor of rural school's pupils. Julius's study

is very consistent with this study in content covered, design of the study, instrumentation and tools for data analyses. However, Julius studied only achievement and location of schools while this study addressed achievement, interest and school type. Inspite of these variations, Julius's study aided the researcher in making inferences in this study.

Kennedy (2019) investigated the effect of Audio Animation Instructional media on Primary School pupils achievement and retention in literacy in Central-Finland. Six research questions and eight hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. The study was conducted in Central-Finland from where a sample of 1306 primary school pupils was drawn using purposive, stratified and simple random sampling techniques. Instrument used for data collection was Literacy Achievement Test (LAT) constructed by the researchers and validated by five research experts. LAT was made up of 40 multiple choice items each with 4 options. It yielded an internal consistency reliability coefficient of .82 obtained by Kudar-Richardson 20 formula. Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA).

Major findings of the study showed that audio animation inhibited the pupils' achievement and retention in literacy. Hence, pupils taught with charts achieved higher and retained more in literacy than their counterparts taught with Audio Animation Instructional media. Male and female pupils did not differ significantly in their achievement and retention in literacy when taught with Audio Animation Instructional media. Kennedy studied achievement and retention in literacy but this study was interested in pupils' achievement and interest in literacy. Kennedy considered gender as a factor but this study considered school type. However, both studies are similar in literacy content addressed, design adopted, instrument for data collection and statistical tools for data analyses. Consequently, Kennedy's study was useful in discussion of findings in this study.

Oluremi (2014) in a study titled effect of Audio Animation Instructional media on middle basic pupil's achievement in

Shagamu Ogun state adopted a quasi-experimental design. Pretest-posttest, non-equivalent control group design was used. A sample of 692 pupils was drawn from intact classes in the six middle basic schools in Shagamu Ogun state. The sample was drawn using proportionate, cluster and simple random sampling techniques. Intact classes were randomly assigned experimental and control groups. Six research questions and six hypotheses guided the study. A researcher-made mean Literacy Achievement Test (LAT) was used to collect data in the study. LAT was validated by a team of linguistic educators. LAT had 40 multiple choice questions with five options (A-E) each. LAT yielded a reliability coefficient of .84 through test retest method. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at .05 level of significance using z-test statistic. Major findings of the study revealed that pupils taught with Audio Animation Instructional media achieved higher than their counterparts taught with expository method. There was no significant difference between the achievement scores of male and female pupils taught with Audio Animation Instruction media. Oluremi's study is related to this study in content, design, instrumentation and tools for answering research questions. However, Oluremi was interested in pupils' achievement and gender while this study addressed achievement, interest and school type. Despite the differences between Oluremi's study and this present work, Oluremi's findings were helpful in discussion of the findings of this study.

George (2016) in a study titled checkmating pupils' learning outcomes through Audio Animation Instructional media in Washington D.C.USA attempted to determine the effect of Audio Animation Instructional media on Basic Education pupils' learning outcome. It was a quasi-experimental study. Pretest-posttest, non-equivalent control group design was used. A total of 728 basic education pupils was drawn from four intact classes in six schools in Washington D.C USA using stratified and purposive sampling techniques. Intact classes were randomly assigned experimental and control groups. Twelve research questions and twelve hypotheses guided the study. Instrument used for data collection was a 120-item Basic Education Pupils Learning Outcome Test (BEPLOT). The

instrument was constructed by the researcher and validated by a team of selected basic education subject teachers. The instrument was further subjected to a reliability test and it gave a coefficient of .72 obtained through Kuder Richardson formula 20 (KR 20). Mean and standard deviation were used to answer the research questions while the hypotheses were tested at .05 level of significance using z-test.

Major findings of the study revealed that pupils taught with Audio Animation Instructional media, achieved higher than their counterparts taught with expository method. There was no significant difference between the achievement scores of male and female pupils taught with Audio Animation Instructional media. Although George treated the entire basic education subjects, it is still related to this study because English language was one of the subjects George considered. Moreso, George adopted the same design, instrumentation and tools for answering research questions as done in this study. However, George was interested in pupils' achievement (learning outcome and gender) while this study focused on achievement, interest and school type. Also George tested hypotheses with z-test while this study tested hypotheses with Analysis of Covariance (ANCOVA). Despite these differences George's study aided inference in this study.

Nnamani (2018) attempted to determine the effect of Audio Animation Instructional media on middle basic education pupils' achievement in English Language in Enugu state. Four research questions and six hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. The study was conducted in all the six education zones in Enugu State, where a sample of 480 pupils was drawn from 12 intact classes in 6 schools (one from each education zone in Enugu state). Techniques adopted for sampling was purposive and stratified random sampling. Instrument used for data collection was English Language Achievement Test (ELAT). The instrument was constructed by the researchers and validated by three research experts. ELAT had 30 multiple choice items each with 4 options each. It yielded a stability coefficient of .78 obtained through test–retest approach. ELAT also yielded an internal consistency reliability coefficient of .82 obtained

by Kudar-Richardson 20 formula. Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA).

Major findings of the study showed that pupils taught English language with Audio Animation Instructional media achieved higher than their counterparts taught same topics with expository method. Also, male and female pupils did not differ significantly in their achievement in literacy when taught with Audio Animation Instructional media. Nnamani studied only achievement in English language but this study was interested in pupils' achievement and interest in English language. Nnamani considered gender as a factor but this study considered school type. However, both studies drew content from English language and audio animation instructional media. Both studies also adopted same design, instrumentation and same tools for data analyses. Therefore, Nnamani's study is consistent with this study.

Olayinka (2015) studied the effect of Audio Animation Instructional media on pupils' achievement in literacy in Ilorin, Kwara state. The design of the study was quasi experimental, specifically pre-test–post-test control group. The study was carried out in Ilorin, Kwara state where a sample of 55 pupils consisting of 30 males and 25 females from two intact classes was used for the study. The two intact classes were randomly assigned experimental and control groups. Three research questions and three hypotheses guided the study. Literacy Achievement Test (LAT) was used for data collection. Mean, standard deviation and t-test statistics were used for data analyses. Results obtained revealed that Audio Animation Instructional media distracted the pupils. Hence, pupils taught with lecture method achieved higher in literacy than their counterparts taught with Audio Animation Instructional media. Female pupils achieved higher than their male counterparts in the study. The work of Olayinka is similar to this work in design, content and instrumentation. Also both studies answered research questions with mean and standard deviation. However, this study adopted ANCOVA for hypotheses testing (not t-test as used by Olayinka). This study also addressed pupils' achievement, interest and influence of school type while Olayinka studied only pupils

achievement and pupils gender. In the same vein, this study adopted larger sample than the one adopted by Olayinka. Notwithstanding the highlighted differences, Olayinka's work was useful to this study in drawing conclusions.

Baraje (2015) investigated the effect of Audio Animation Instructional media on pupils' achievement in literacy in Cape Town. Baraje adopted a non-equivalent quasi-experimental design. A sample of 292 pupils was drawn from four single schools in Cape Town and used for the study. Data collection for the study was done with a 35 item Literacy Achievement Test (LAT). The instrument was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .79 obtained through test retest method. Mean, standard deviation and Analysis of covariance (ANCOVA) were used for data analyses. Findings of the study revealed that pupils achieved higher in literacy when taught with lecture method than when taught with Audio Animation Instructional media. Pupils in urban and rural schools did not differ significantly in their achievement in literacy when taught with Audio Animation Instructional media. Baraje's study is very consistent with this study in content covered, design of the study, instrumentation and tools for data analyses. However, Baraje studied only achievement and location of schools while this study addressed achievement, interest and school type. Inspite of these variations, Baraje's study aided the researcher in making inferences in this study.

Empirical studies reviewed above on Basic Education Pupils' achievement in literacy when taught with Audio Animation Instructional media have shown a no definitive conclusion status. While some researchers found Audio Animation to be more effective for enhancing pupils' achievement in literacy, others reported the contrary. This gap constituted one of the major challenges this study addressed.

Studies on Pupils' Interest in Literacy

Agada (2018) attempted to determine the effect of Audio Animation Instructional media on middle basic education pupils' interest in English Language in Benue state. Four research questions

and six hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. The study was conducted in all the three senatorial zones of Benue State, where a sample of 233 pupils was drawn from 6 intact classes in 3 schools. Techniques adopted for sampling was purposive and stratified random sampling. Instrument used for data collection was English Language Interest Scale (ELIS). The instrument was constructed by the researchers and validated by three research experts. ELIS had 18 items rated on 4 point scale. ELIS yielded an internal consistency reliability coefficient of .69 obtained through Cronbach's Alpha Method. Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA).

Major findings of the study showed that pupils taught English language with Audio Animation Instructional media showed higher interest than their counterparts taught same topics with charts. Also, male and female pupils did not differ significantly in their interest in literacy when taught with Audio Animation Instructional media. Agada studied only interest in English language but this study was interested in pupils' achievement and interest in English language. Agada considered gender as a factor but this study considered school type. However, both studies drew content from English language and audio animation instructional media. Both studies also adopted same design, instrumentation and same tools for data analyses. Therefore, Agada's study is consistent with this study.

Buckie (2016) in a quasi-experimental study attempted to determine the effect of Audio Animation Instructional media on pupils' interest in literacy in Michigan, USA. Pretest-posttest control group design was adopted for the study. Eight non-equivalent intact classes were randomly drawn from two public and two private schools using purposive and stratified simple random sampling techniques. 182 pupils in the eight intact classes constituted sample for the study. Literacy Interest Scale (LIS) was used to obtain the interest scores. LIS was constructed by the researcher and validated by five research experts. It yielded a reliability coefficient of .88 through Cronbach's Alpha method.

Four research questions and four hypotheses guided the study. Buckie answered research questions with mean and standard deviation and tested hypotheses with Analysis of Covariance (ANCOVA). According to Buckie, major findings showed that pupils taught literacy with lecture method showed more interest than their counterparts who were taught same topics with Audio Animation Instructional media. Buckie further reported that coeducational schools pupils developed higher interest than their single sex school's counterparts in both control and experimental groups. Buckie's work is very consistent with this present study in content covered, design adopted, instrumentation and statistical tools for data analyses. However, Buckie treated pupils' interest in literacy and school type (coeducational and single sex) while this study addressed achievement and interest of pupils in literacy with respect to their school type (public and private). Based on the similarities of both studies, Buckie's work guided discussions in this study.

Natshi (2016) investigated the effect of Audio Animation Instructional media on pupil's interest in literacy in Kenya, Central Africa. Natshi sampled two schools, one in an urban city, and the other in a rural community all in Kenya, Central Africa. Natshi's interest was to determine if there existed significant difference between the subjects with regard to the location of their schools and the strategies used in teaching them. Quasi experimental research design was adopted for the study. Four research questions and five hypotheses guided the study. Four non-equivalent intact classes drawn from two schools were used. Two classes were drawn from the urban school and the other two classes from the rural school. This was done using proportionate and simple random sampling techniques. The entire 166 pupils in the four non equivalent classes became sample for the study. Literacy Interest Inventory (LII) constructed by the researcher was used for data collection. LII was used to obtain the pretest and posttest interest scores of the pupils. It was made up of 16 items scored on 4 point scale. LII was validated by five research experts and gave a reliability coefficient of .69 through Cronbach's Alpha method. Mean and standard deviation

were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses.

Major findings of the study revealed that pupils taught the selected literacy topics with Audio Animation Instructional media showed higher interest in literacy than their counterparts taught same topics with chart. Location of schools had no significant effect on pupils' interest in literacy when taught with Audio Animation Instructional media. This present study is closely related to Natshi's work as both studies investigated the effect of Audio Animation Instructional media. Both studies addressed pupils' interest in literacy, used same design, similar instrument for data collection and same tools for data analyses. On the otherhand, while Natshi studied only pupils interest and location of schools as variables, this study treated pupils achievement and interest as well as school type ass variables. Yet, this study drew much relevance from Natshi's work.

Akpan (2014) investigated the effect of Audio Animation Instructional media on pupils' interest in literacy in Uyo Metropolis, Akwa-Ibom State. It was an experimental study, specifically, a quasi-experiment. Four intact classes were drawn from two public primary schools in Uyo Metropolis, Akwa-Ibom state through purposive and simple random sampling techniques. Also simple random sampling technique was used for assigning the intact classes to experimental and control groups. The entire pupils in the intact classes numbering 152 constituted sample for the study. Experimental groups were taught with Audio Animation Instructional media while the control groups were taught with expository method. Literacy Interest Inventory (LII) was used to collect interest scores before and after the teaching. LII was structured on a 4 point scale (Strongly Agreed, Agreed, Disagreed and Strongly Disagreed). It was a researcher made instrument validated by three research experts and yielded a reliability coefficient of .78 via Cronbach's Alpha technique. LII consisted of 22 items coined to elicit information on the pupils' interest in literacy. Mean statistic and Analysis of Covariance (ANCOVA) were used for data analyses.

Akpan reported that the experimental group who were taught the selected literacy topics with Audio Animation Instructional

media showed lower interest in literacy than the control groups who were taught the same topics with expository method. Male and female pupils did not differ significantly in their interest in literacy in the study. The work of Akpan is similar to this work in design, content and instrumentation. Also both studies tested hypotheses with Analysis of Covariance. Conversely, Akpan answered research question with mean statistic while mean and standard deviation were used to answer research questions in this study. This study also addressed pupils' achievement, interest and influence of school type while Akpan studied only pupils interest and gender. In the same vein, this study adopted larger sample than the one adopted by Akpan. Notwithstanding the highlighted differences, Akpan's work was useful to this study in drawing conclusions.

Hassan (2014) in a quasi-experimental study attempted to determine the effect of Audio Animation Instructional media on pupils' interest in literacy in Auchi, Edo state. Pretest-posttest control group design was adopted for the study. Eight non-equivalent intact classes were randomly drawn from two public and two private schools used for the study. All the 242 pupils in the eight intact classes became sample for the study. Literacy Interest Scale (LIS) was used to obtain the pretest and posttest interest scores in the study. Hassan adopted LIS from a standardized Interest scale. LIS was made up of 32 items rated on a four point scale. Four research questions and four hypotheses guided the study. Major findings of the study showed that pupils taught literacy with Audio Animation Instructional media showed higher interest than their counterparts who were taught same topics with charts. Hassan further reported that urban schools pupils showed higher interest than their rural schools counterparts in both control and experimental groups. Hassan's study is very consistent with this study in content covered, design of the study, instrumentation and tools for data analyses. However, Hassan studied only interest and location of schools while this study addressed achievement, interest and school type. Inspite of these variations, Hassan's study aided the researcher in making inferences in this study.

Ferdinand (2017) investigated the Effect of Audio Animation Instructional media on pupil's interest in Literacy in

North East Sweden. Quasi experimental research design was adopted for the study. Four research questions and four hypotheses guided the study. Ferdinand sampled four schools, two in an urban city, and the other two in a rural community all in North East Sweden. Eight non-equivalent intact classes drawn from the four schools (two urban and two rural) were used. From these classes, Ferdinand drew a sample of 305 pupils through proportionate and simple random sampling techniques. A 24-item Literacy Interest Scale (LIS) constructed by the researcher was used for data collection. LIS was validated by five research experts and was used to obtain the interest scores of the pupils. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses.

Major findings of the study indicated that pupils taught the selected literacy topics with Audio Animation Instructional media showed higher interest than their counterparts taught same topics with charts. Location of schools had significant effect on pupils' interest in literacy when taught with Audio Animation Instructional media in favor of urban school's pupils. Ferdinand's study is closely related to this study in content covered, design of the study, instrumentation and tools for data analyses. However, Ferdinand studied only interest and location of schools while this study addressed achievement, interest and school type. Yet, Ferdinand's study aided the researcher in making inferences in this study.

Empirical studies reviewed above on Basic Education Pupils' interest in literacy when taught with Audio Animation Instructional media yielded conflicting findings. While some researchers found Audio Animation enhancing pupils' interest in literacy, others found Audio Animation distracting the pupils thereby inhibiting their interest in literacy. This gap further justify the need for this study.

Studies on Influence of School Type on Pupils' Achievement and Interest in Literacy

Justice (2017) studied the Effect of Computer Aided Instruction on achievement and Interest of basic education pupils in English grammar in Dundee, Scotland. The design of the study was

quasi experimental, specifically pre-test – post-test control group. The study was carried out in Dundee, Scotland where a sample of 324 pupils consisting of 160 pupils in public and 164 pupils in private schools was drawn. The sample was drawn from eight intact classes in four schools. The eight intact classes were randomly assigned experimental and control groups. Five research questions and five hypotheses guided the study. Justice used Animated Computer Aided Instruction (Animated CAI) to teach the experimental group while the control group was taught with Static Computer Aided Instruction (Static CAI). English grammar topics treated by Justice included literacy, comprehension, dictation and spelling. English Grammar Achievement Test (EGAT) and English Grammar Interest Scale (EGIS) were used for data collection. EGAT had 40 items while EGIS was made up of 18 items scored on a 4-point scale. EGAT and EGIS were constructed by the researcher and validated by three research experts. Reliability indices of .70 and .81 were obtained for EGAT and EGIS respectively. Kudar Richardson formula 20 (KR 20) and Cronbach's Alpha method were used to calculate the reliability indices for EGAT and EGIS respectively. Mean, standard deviation and chi-square statistic were used for data analyses. Results obtained revealed that Animated CAI was more effective and enhanced pupils' achievement and interest in English grammar than Static CAI. Public school pupils achieved higher and showed more interest than their private schools' counterparts in the experimental groups. Justice's work is consistent to this study in research design used, instrumentation, choice of statistical tools for answering research question and variables studied. Like this study, Justice treated the experimental group with Animated CAI, that is CAI with animations. On the otherhand, Justice covered more English content than those covered in this present study. Justice treated control group with Static CAI while charts were used in control groups in this study. Justice tested hypotheses with chi-square statistic while Analysis of Covariance (ANCOVA) was used in this study for hypotheses testing. Also, Justice's work was done in Dundee, Scotland while this study was done in Agbani Education Zone of Enugu state, Nigeria. Despite the

above highlighted differences, Justice's study aided inference in this present study.

Imuno (2015) investigated the effect of Audio Animation Instructional media on pupil's achievement and interest in literacy in Accra, Ghana. It was an experimental study, specifically, a quasi-experiment. Four intact classes were drawn from Accra Educational District. Two of the classes were from public and two from private schools. Purposive and stratified sampling techniques were adopted in the sampling. The classes so drawn were randomly assigned to experimental and control groups. Focus of the researcher was comparing the achievement and interest of public and private schools' pupils in literacy when taught with Audio Animation Instructional media. Four research questions and four hypotheses guided the study. Instruments used for data collection were Literacy Achievement Test (LAT) and Literacy Interest Scale (LIS). LAT and LIS were constructed by the researcher and validated by three research experts. Reliability coefficients of .88 and .72 were obtained for LAT and LIS respectively. Mean and Analysis of Covariance (ANCOVA) were used for data analyses.

Imuno reported that the experimental group who were taught the selected literacy topics with Audio Animation Instructional media achieved higher and showed more interest than the control groups who were taught the same topics with charts. Also public school pupils achieved higher and showed more interest in literacy than their counterparts in private schools. Imuno's work relate with this present study in many ways. Imuno adopted the same design, used similar instruments, tested hypotheses with same tool and treated people's achievement and interest in literacy as well as studying the influence of school type as done in this study. Like this study, Imuno used audio animation and charts to teach experimental and control groups respectively. However, Imuno answered research questions with only mean while mean and standard deviation were used to answer research questions in this study. Also, Imuno's work was done in Accra while this study was carried out in Nigeria. Yet, Imuno's study is consistent with this present work.

Nuhu (2015) in a quasi-experimental study attempted to determine the effect of Audio Animation Instructional media on pupils' achievement and interest in English language in Zaria, Kaduna state. Pretest-posttest control group design was adopted for the study. Eight non-equivalent intact classes were randomly drawn from two public and two private schools. The schools were drawn from two strata purposively created to cover public and private schools. 310 pupils in the eight intact classes formed the sample for the study. English Language Achievement Test (ELAT) and English Language Interest Inventory (ELII) were used to obtain the pretest and posttest achievement and interest scores respectively. ELAT and ELII were constructed by the researcher and validated by three research experts. Reliability coefficients of .91 and .94 were obtained for ELAT and ELII respectively. Four research questions and four hypotheses guided the study. Mean, standard deviation and Analysis of Covariance (ANCOVA) were used for data analyses.

According to Nuhu, major findings showed that pupils taught English language with Audio Animation Instructional media achieved lower and showed less interest in English language than their counterparts who were taught same topics with charts. Nuhu further reported that private schools' pupils achieved higher and showed more interest than their public schools' counterparts in both control and experimental groups. Nuhu's work is similar to this study in research design used, instrumentation, choice of tools for data analyses and variables studied. Conversely, Nuhu covered other topics in English language apart from literacy while this study focused only on literacy. Nuhu's work was done in Zaria Kaduna state while this study was done in Agbani Education Zone of Enugu state. Notwithstanding, Nuhu's work is consistent with this present study.

Wale (2016) studied the effect of Audio Animation Instructional media on pupils' achievement and Interest in literacy in Ijebu-ode, Ogun State. The design of the study was quasi experimental, specifically pre-test – post-test control group. The study was carried out in Ijebu-ode, Ogun State where a sample of 162 pupils consisting of 88 pupils in public and 74 pupils in private schools was drawn. The sample was drawn from four intact classes

in two schools. The four intact classes were randomly assigned experimental and control groups. Four research questions and six hypotheses guided the study. Literacy Achievement Test (LAT) and Literacy Interest Inventory (LII) were used for data collection. LAT had 40 items while LII was made up of 18 items. LII was scored on a 4-point scale. LAT and LII were constructed by the researcher and validated by three research experts. Reliability indices of .69 and .71 were obtained for LAT and LII respectively. Kudar Richardson formula 20 (KR 20) and Cronbach's Alpha method were used to calculate the reliability indices for LAT and LII respectively. Mean, standard deviation and t-test statistic were used for data analyses. Results obtained revealed that Audio Animation Instructional media was more effective and enhanced pupils' achievement in literacy than the expository method. Public school pupils achieved higher and showed more interest than their private schools' counterparts in the experimental groups. Wale's work is consistent to this study in research design used, instrumentation, choice of statistical tools for answering research question and variables studied. However, Wale tested hypotheses with t-test statistic while ACOVA was used in this study for hypotheses testing. Also, Wale's work was done in Ijebu-ode, Ogun state while this study was done in Agbani Education Zone of Enugu state. Despite the above highlighted differences, Wale's study aided discussion of findings in this present study.

Derbuck (2014) attempted to determine the effect of Audio Animation Instructional media on basic education pupils' achievement and interest in literacy in Southern Educational District of Singapore. Four research questions and six hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. The study was conducted in Southern Educational District of Singapore where a sample of 476 pupils was drawn from 12 intact classes in the six schools (3 private and 3 public school). Techniques adopted for sampling was purposive and stratified random sampling. Instruments used for data collection were Literacy Achievement Test (LAT) and Literacy Interest Scale (LIS). The instruments were constructed by the researcher and validated by three research experts. LAT had 40 multiple choice items with 4 options each while LIS had 22-items rated on a 4-point

scale. Reliability coefficients of .72 and .65 were obtained for LAT and LIS respectively. Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA). Major findings of the study showed that pupils taught literacy with expository method achieved higher than their counterparts taught same topics with Audio Animation Instructional media. Also, private school pupils achieved higher in literacy than their counterparts taught same topics in the public schools. Like this study, Derbuck used audio animation instructional media to teach experimental group. Also, Derbuck adopted the same design, used similar instruments, answered research questions and tested hypotheses with same tools and treated pupil's achievement and interest in literacy as well as studying the influence of school type as done in this study. On the otherhand, Derbuck used expository method without charts to teach the control groups while charts were used for teaching control groups in this study. Also, Derbuck's work was done in Singapore while this study was carried out in Nigeria. Notwithstanding, Derbuck's study is consistent with this present work.

From the foregoing, empirical studies on influence of school type on pupils' achievement and interest in literacy when taught with Audio Animation Instructional media still maintain the status of no definitive conclusion thereby suggesting the need for more studies such as this present work.

CHAPTER 24

Topic:

INFORMATION AND COMMUNICATION TECHNOLOGY COMPETENCIES NEEDED FOR EFFECTIVE TEACHING AND LEARNING OF EDUCATIONAL TECHNOLOGY COURSES IN UNIVERSITIES IN SOUTH EAST NIGERIA

Here are reviews of some empirical works related to this topic

Studies on Web-based Research Competencies Needed for Effective Teaching and Learning of Educational Technology Courses.

Nelson (2018), conducted a descriptive survey in Northern Ireland, United Kingdom to identify online research competencies required for effective teaching and learning of educational technology courses in selected Irish Universities. Sample for the study consisted of 125 lecturers and 1,350 undergraduates. Techniques used to draw the samples were stratified and simple random sampling techniques. Four research questions and four hypotheses guided the study. Instrument used for data collection was a 67-item questionnaire graded on a 4-point scale. The questionnaire was validated by 5 research experts. It yielded a reliability coefficient of .91. Research question were answered with mean and standard deviation while z-test statistic was used for hypotheses testing.

In the major findings, Nelson reported that major online research competencies required for effective teaching and learning of educational technology courses in selected Irish Universities include; key word identification competencies, internet browsing competencies, brainstorming competencies, lateral-thinking competencies, reduction competencies and analytical competencies. According to Nelson, male and female respondents did not differ

significantly in their ratings. Nelson's study is closely related to this study in so many ways. Foremost, both studies treated online (or web-based) research competencies required for effective teaching and learning of educational technology courses. Also, both studies had interest in influence of gender of the respondents, both adopted same design and same tools for data analyses. However, Nelson's study was restricted to web-based research competencies only while this study treated four more ICT competencies (digital data processing, e-learning, artificial intelligence utilization and educational social media utilization competencies). Notwithstanding these differences, Nelson's study and findings aided inferences in this study.

In a descriptive survey, Adelabu (2018) investigated the level of web-based research skills needed by university lecturers for effective teaching of educational technology courses in Ondo state. The study was guided by three research questions and three hypotheses. The population for the study was 2,405 university lecturers, from which a sample of 95 lecturers (34 males and 61 females) were drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire structured to collect data on the level of web-based research skills possessed by university lecturers for effective teaching of educational technology courses in Ondo state. The questionnaire was made up of 30-items rated on 4-point scale: Very High, High, Low, and Very Low. Three research experts validated the questionnaire. It yielded a reliability coefficient of .89 obtained through Cronbach's Alpha method. Adelabu answered research questions with mean and standard deviation but tested hypotheses with Analysis of Variance (ANOVA).

In major findings, Adelabu's respondents opined that lecturers needed just minimal Web-based research skills to teach educational technology courses effectively in universities in Ondo State. Also, lecturers in public and private universities did not differ significantly in their opinions in Adelabu's study. Adelabu focused only on web-based research skills for effective teaching of educational technology courses while this study addressed five different ICT competencies for effective teaching and learning of

educational technology courses. Adelabu tested hypothesis with ANOVA while z-test statistic was used for hypothesis testing in this study. Adelabu's hypothesis were based on public/private universities (school ownership) while hypothesis in this study was based on gender of respondents (male/female). Notwithstanding these differences, Adelabu's study and this study are related in many ways. In the first place, both studies were interested in web-based research competencies. Secondly, both studies adopted same research design and sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Consequently, Adelabu's study is consistent with this present one.

Batagarwa (2019), attempted to identify the web-based research competencies required for effective teaching and learning of educational technology courses in tertiary institutions in North West Geopolitical zone of Nigeria. It was descriptive survey research guided by three research questions and two hypotheses. Population for the study was 796 Educational technology lecturers in tertiary institutions in North West Geopolitical zone. A Sample of 425 lectures was drawn from the population using cluster and simple random sampling techniques. A questionnaire titled "Web-Based Research Competencies Questionnaire (WERCOQ)" was constructed by the researcher and used for data collection in the study. The questionnaire was validated by three research experts. It yielded a reliability coefficient of .76 obtained through Cronbach's Alpha method. Research question were answered with mean and standard deviation while t-test statistic was used for hypotheses testing.

In the major findings, Batagarwa identified downloading, printing webpage, saving, webpage retrieval, short-cut operations, webpage sharing, web link saving and web link sharing as main web-based research competencies required for effective teaching and learning of educational technology competencies in tertiary institutions in North West Geopolitical zone of Nigeria. According to Batagarwa, male and female respondents differed significantly in their responses. Male respondents favored the ICT competencies articulated in the study while their female counterparts did not. Batagarwa's study is closely related to this study. In the first

instance, web-based research competencies required for effective teaching and learning of educational technology courses formed a major component of the content both studies covered.

Also, both studies were interested in influence of gender of the respondents, both adopted same design and same tools for answering research questions. However, Batagarwa's study was restricted to web-based research competencies only while this study covered other ICT competencies such as digital data processing, e-learning, artificial intelligence utilization and educational social media utilization competencies. Batagarwa tested hypothesis with t-test but z-test was used for that purpose in this study. Batagarwa covered tertiary institutions (Universities, polytechnics, colleges of education etc) whereas this study was restricted to universities. Despite these differences, Batagarwa's study aided useful comparison and inferences in discussing findings made in this study.

Egba (2020) conducted descriptive survey research on web-based research skills required for teaching and learning of core education courses in universities in Ebonyi state. Egba formulated four research questions and four hypotheses. Stratified and simple random sampling techniques were used to draw a sample of 36 lecturers from a population of 89 as at the time of the study. Data were collected using a researcher-made questionnaire captioned "Questionnaire on web-based research skills for teaching and learning of core education courses", (QUWREC). The Questionnaire was validated by three research experts. It yielded a reliability coefficient of .93 through Cronbach's Alpha Method. Egba answered research questions with mean and standard deviation while chi-squared statistic was used for hypotheses testing.

In major findings, Egba identified, Keyboard mastery, key words identification, Brain storming, Web page management, reduction and web site linkages as vital web-based research skills needed for teaching and learning of core education courses in universities in Ebonyi state. According to Egba, male and female respondents differed significantly in their responses. Female respondents favored the ICT competencies suggested in the study while their male counterparts did otherwise. Egba concentrated only on web-based research skills unlike this study that covered four

other ICT competences. Egba covered the entire core Education course but this study focused on Educational Technology. Egba tested hypotheses with chi-squared statistic but Z-test was used to test hypotheses in this study. On the other hand, Egba's study is related to this study in content, design, instrumentation and statistical tools for answering research questions. Hence Egba's work is very relevant to this study.

Wilson (2021) attempted to determine the Adequacy of Web-based research competences possessed by students for effective learning of educational technology courses in Bayelsa state. Ex-Post Facto research design was adapted for the study. The study was guided by five research questions and five hypotheses. Population for the study was 322 university students studying Educational Technology and related courses in Bayelsa state. From this population, a sample of 4,338 students was drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire designed to collect data on the Adequacy of web-based research competences possessed by students for effective learning of educational technology courses in Bayelsa state. The instrument contained 50-items rated on 4-point scale: Very Adequate, Adequate, Inadequate, and Very Inadequate. Three research experts validated the questionnaire. It yielded a reliability coefficient of .91 obtained through Cronbach's Alpha method. Wilson answered research questions with mean and standard deviation but tested hypotheses with T-test statistic.

In major findings, Wilson reported that the students' web-based research competences were good but not necessarily adequate for effective learning of educational technology courses. In other words, the students could learn effectively without those competencies. The opinion was same for male and female students. Wilson was interested in Adequacy of competences possessed by the students whereas this study focused on the competencies needed for effective teaching and learning of educational technology courses. Wilson focused only on web-based research competences for effective learning of educational technology courses while this study was interested in five different ICT competencies for effective

teaching and learning of educational technology courses. Wilson tested hypothesis with T-test statistic while z-test statistics was used for hypothesis testing in this study. Wilson Adopted EX-Post Facto research design while descriptive survey research design was adopted for this study.

Notwithstanding these differences, Wilsons' study and this study are related in many ways. In the first place, both studies were interested in web-based research competencies. Secondly, both studies adopted same sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Furthermore, both studies considered influence of respondents' gender. Consequently, Wilson study is consistent with this present one.

Studies on Digital Data Processing Competencies Needed for Effective Teaching and Learning of Educational Technology Courses.

Tahir (2020), attempted to identify the Digital Data Processing competencies required for effective teaching and learning of educational technology courses in colleges and universities in South East India. It was a descriptive survey research guided by three research questions and two hypotheses. Population for the study was 2,145 Educational technology lecturers in colleges and universities in South East India. A Sample of 1,500 lectures was drawn from the population using cluster and simple random sampling techniques. A questionnaire titled "Questionnaire on Digital Data Processing Competencies (QDDPC)" was constructed by the researcher and used for data collection in the study. The questionnaire was made up of 35 items and validated by five research experts. It yielded a reliability coefficient of .95 obtained through Cronbach's Alpha method. Research questions were answered with simple percentage while t-test statistic was used for hypotheses testing.

In the major findings, Tahir identified downloading, text review, reviewed text correction, page layout formatting, printing, spreadsheet operations, data presentations in tables, data presentation in charts, data presentation in pictograph and graph

constructions as main Digital Data Processing competencies required for effective teaching and learning of educational technology courses in colleges and universities in South East India. According to Tahir, male and female respondents differed significantly in favour of the male lecturers who supported the findings. Tahir's study is closely related to this study. In the first instance, web-based research competencies required for effective teaching and learning of educational technology courses formed a major component of the content both studies covered.

Also, both studies were interest in influence of gender of the respondents. However, Tahir's study was restricted to Digital Data Processing research competencies only while this study covered other ICT competencies such as (web-based research, e-learning, artificial intelligence utilization and educational social media utilization competencies). Tahir answered research questions and tested hypotheses with simple percentage and t-test statistic respectively while this study used mean and standard deviation to answer research question and z-test for hypotheses testing. Tahir covered colleges and universities whereas this study was restricted to universities. Despite these differences, Tahir's study aided useful comparisons and inferences in this study.

In a descriptive survey, Donaldson (2020) investigated the extent of digital data processing competencies possessed by university students for effective learning of educational technology courses in Rivers State, Nigeria. The study was guided by six research questions and six hypotheses. The population for the study was 3,405 university students, from which a sample of 97 students (35 males and 62 females) were drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire structured to collect data on the level of digital data processing competencies possessed by university students for effective learning of educational technology courses in Rivers State, Nigeria. The questionnaire was made up of 30 items rated on 4-point scale: Very High Extent, High Extent, Low Extent, and Very Low Extent. Three research experts validated the questionnaire. It yielded a reliability coefficient of .89 obtained through Cronbach's Alpha method. Donaldson answered research

questions with mean and standard deviation but tested hypotheses with Analysis of Variance (ANOVA).

In major findings, Donaldson reported that the students possessed low level of digital data processing competencies yet they could attain effective learning of educational technology courses in Rivers State, Nigeria. Also, students in private universities possessed higher level of digital data processing competencies than their counterparts in public universities in Rivers State, Nigeria. Donaldson was interested in level of competencies possessed by the students whereas this study focused on the competencies needed by the students for effective learning of educational technology courses. Donaldson focused only on digital data processing competencies for effective learning of educational technology courses while this study is interested in five different ICT competencies for effective teaching and learning of educational technology courses. Donaldson tested hypothesis with ANOVA while z-test statistics was used for hypothesis testing in this study.

Donaldson's hypotheses were based on public/private universities (school ownership) while hypothesis in this study were based on gender of respondents (male/female). Notwithstanding these differences, Donaldson's study and this study were related in many ways. In the first place, both studies were interested in digital data processing competencies. Secondly, both studies adopted same research design and sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Consequently, Donaldson's study is consistent with this present one.

Otunta (2021) attempted to determine the Adequacy of digital data processing competences possessed by students for effective learning of educational technology courses in Rivers State. EX-Post Facto research design was adapted for the study. The study was guided by four research questions and four hypotheses. Population for the study was 2,522 university students studying Educational Technology and related courses in Rivers State. From this population, a sample of 338 students was drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire designed to collect data on the Adequacy of web-based research competences possessed by

students for effective learning of educational technology courses in Rivers State. The instrument contained 48-items rated on 4-point scale: Very Adequate, Adequate, Inadequate, and Very Inadequate. Three research experts validated the questionnaire. It yielded a reliability coefficient of .71 obtained through Cronbach's Alpha method. Otunta answered research questions with mean and standard deviation but tested hypotheses with T-test statistic.

In major findings, Otunta reported that the students' digital data processing competences were adequate for effective learning of educational technology courses. The adequacy was same for male and female students. Otunta was interested in Adequacy of competences possessed by the students whereas this study focused on the competencies needed for effective teaching and learning of educational technology courses. Otunta focused only on digital data processing competences for effective learning of educational technology courses while this study was interested in five different ICT competencies for effective teaching and learning of educational technology courses. Otunta tested hypothesis with T-test statistic while z-test statistics was used for hypothesis testing in this study. Otunta Adopted EX-Post Facto research design while descriptive survey research design was adopted for this study. Notwithstanding these differences, Otunta study and this study were related in many ways. In the first place, both studies were interested in digital data processing competencies. Secondly, both studies adopted same sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Furthermore, both studies considered influence of respondents' gender. Consequently, Otunta study is consistent with this present one.

Adogo (2021), conducted a descriptive survey in Benue State, to identify digital data processing competencies required for effective teaching and learning of educational technology courses. Sample for the study consisted of 98 lecturers and 1,310 undergraduates. Techniques used to draw the samples were stratified and simple random sampling techniques. Five research questions and five hypotheses guided the study. Instrument used for data collection was a 37-item questionnaire graded on a 4-point scale. The questionnaire was validated by 3 research experts. It

yielded a reliability coefficient of .89. Research questions were answered with mean and standard deviation while z-test statistic was used for hypotheses testing.

In the major findings, Adogo reported that major digital data processing competencies required for effective teaching and learning of educational technology courses in Benue State include; Editing, sorting, organizing, arranging and analyzing. According to Adogo, male and female respondents did not differ significantly in their ratings. Adogo's study is closely related to this study in so many ways. Foremost, both studies treated digital data processing competencies required for effective teaching and learning of educational technology courses. Also, both studies had interest in influence of gender of the respondents, both adopted same design and same tools for data analyses. However, Adogo's study was restricted to digital data processing competencies only while this study treated four more ICT competencies (web-based research, e-learning, artificial intelligence utilization and educational social media utilization competencies). Notwithstanding these differences, Adogo's study and findings aided inferences in this study.

Kpei (2022) conducted a descriptive survey research on digital data processing skills required for teaching and learning of core education courses in universities in Central Kenya. Kpei formulated four research questions and four hypotheses. Stratified and simple random sampling techniques were used to draw a sample of 62 lecturers from a population of 139 as at the time of the study. Data were collected using a researcher-made questionnaire captioned "Questionnaire on Digital Data Processing skills for teaching and learning of core education courses", (QDPEC). The Questionnaire was validated by three research experts. It yielded a reliability coefficient of .97 through Cronbach's Alpha Method. Kpei answered research questions with mean and standard deviation while chi-squared statistic was used for hypotheses testing.

In major findings, Kpei identified, organizing, arranging, printing, spreadsheet operations, data presentations in tables, data presentation in pictograph and graph constructions as digital data processing skills needed for teaching and learning of core education courses in universities in Central Kenya. According to Kpei, male

and female respondents differed significantly in their responses. Female respondents favored the ICT competencies articulated in the study while their male counterparts did not. Kpei concentrated only on digital data processing skills unlike this study that covered four other ICT competences. Kpei covered the entire core Education course but this study focused on Educational Technology. Kpei tested hypotheses with chi-squared statistic but Z-test will be used to test hypotheses in this study. On the other hand, Kpei's study was related to this study in content, design, instrumentation and statistical tools for answering research questions. Hence Kpei's work is very relevant to this study.

Studies on E-learning Competencies Needed for Effective Teaching and Learning of Educational Technology Courses.

Ogbonna (2019), conducted a descriptive survey to identify E-learning competencies required for effective teaching and learning of educational technology courses in Universities in Abia State. Sample for the study consisted of 105 lecturers and 1,400 undergraduates. Techniques used to draw the samples were stratified and simple random sampling techniques. Three research questions and three hypotheses guided the study. Instrument used for data collection was a 67-item questionnaire graded on a 4-point scale. The questionnaire was validated by 5 research experts. It yielded a reliability coefficient of .83. Research questions were answered with mean and standard deviation while z-test statistic was used for hypotheses testing.

In the major findings, Ogbonna reported that major E-learning competencies required for effective teaching and learning of educational technology courses include; zoom meeting scheduling, shearing screen on zoom, video expressions on zoom, muting options on zoom, meeting calendar creation on zoom, zoom meeting cancelation, whatsapp voice call conference meeting, whatsapp video call conference meeting, online text review and online editing of reviewed texts. According to Ogbonna, male and female respondents did not differ significantly in their ratings. Ogbonna's study was closely related to this study in so many ways. Foremost, both studies treated E-learning competencies required for

effective teaching and learning of educational technology courses. Also, both studies had interest in influence of gender of the respondents, both adopted same design and same tools for data analyses. However, Ogbonna's study was restricted to E-learning competencies only while this study treated four more ICT competencies (web-based research, digital data processing, artificial intelligence utilization and educational social media utilization competencies). Notwithstanding these differences, Ogbonna's study and findings aided inferences in this study.

In a descriptive survey, Tachy (2019) investigated the level of E-learning skills possessed by university lecturers for effective teaching of educational technology courses in Mid-Western Switzerland. The study was guided by three research questions and three hypotheses. The population for the study was 2,405 university lecturers, from which a sample of 95 lecturers (34 males and 61 females) were drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire structured to collect data on the level of E-learning skills possessed by university lecturers for effective teaching of educational technology courses in Mid-Western Switzerland. The questionnaire was made up of 35-items rated on 4-point scale: Very High, High, Low, Very Low. Three research experts validated the questionnaire. It yielded a reliability coefficient of .81 obtained through Cronbach's Alpha method. Tachy answered research questions with mean and standard deviation but tested hypotheses with Analysis of Variance (ANOVA).

In major findings, Tachy reported that the lecturers possessed very high level of E-learning skills for effective teaching of educational technology courses in Mid-Western Switzerland. Also lecturers in private universities possessed higher level of E-learning skills than their counterparts in public universities in Mid-Western Switzerland. Tachy was interested in level of skills possessed by the lecturers whereas this study focused on the skills needed by the lecturers for effective teaching of educational technology courses. Tachy focused only on E-learning skills for effective teaching of educational technology courses while this study was interested in five different ICT competencies for effective

teaching and learning of educational technology courses. Tachy tested hypothesis with ANOVA while z-test statistics was used for hypothesis testing in this study. Tachy's hypothesis were based on public/private universities (school ownership) while hypothesis in this study were based on gender of respondents (male/female). Notwithstanding these differences, Tachy's study and this study were related in many ways. In the first place, both studies were interested in E-learning competencies. Secondly, both studies adopted same research design and sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Consequently, Tachy's study is consistent with this present one.

Itoya (2020), attempted to identify the E-learning competencies required for effective teaching and learning of educational technology courses in tertiary institutions in Delta State. It was a descriptive survey research guided by four research questions and five hypotheses. Population for the study was 892 Educational technology lecturers in tertiary institutions in Delta State. A Sample of 423 lectures was drawn from the population using cluster and simple random sampling techniques. A questionnaire titled "E-learning Competencies Questionnaire (ELCOQ)" was constructed by the researcher and used for data collection in the study. The questionnaire was validated by five research experts. It yielded a reliability coefficient of .66 obtained through Cronbach's Alpha method. Research question were answered with mean and standard deviation while t-test statistic was used for hypotheses testing.

In the major findings, Itoya found that though Google meet scheduling, shearing screen on Google meet, video expressions on Google meet, muting options on Google meet, meeting calendar creation on Google meet, Google meet cancelation, e-mail sending, e-mail forwarding and e-mail downloading were good E-learning competencies, these competencies were not necessarily required for effective teaching and learning of educational technology competencies in tertiary institutions in Delta State. In other words, Itoya reported that lecturers could teach educational technology courses effectively without these skills. According to Itoya, male

and female respondents differed significantly in favour of the male lecturers. Itoya's study was closely related to this study. In the first instance, E-learning competencies required for effective teaching and learning of educational technology courses formed a major component of the content both studies covered. Also, both studies were interest in influence of gender of the respondents, both adopted same design and same tools for answering research questions. However, Itoya's study was restricted to E-learning competencies only while this study covered other ICT competencies such as (web-based research, digital data processing, artificial intelligence utilization and educational social media utilization competencies). Itoya tested hypothesis with t-test but z-test was used for that purpose in this study. Itoya covered tertiary institutions (Universities, polytechnics, colleges of education etc) whereas this study was restricted to universities. Despite these differences, Itoya's study aided useful comparison and inferences in this study.

Hanks (2022) conducted a descriptive survey research on E-learning skills required for teaching and learning of core education courses in universities in Oklahoma, USA. Hanks formulated four research questions and two hypotheses. Stratified and simple random sampling techniques were used to draw a sample of 35 lecturers from a population of 83 as at the time of the study. Data were collected using a researcher-made questionnaire captioned "Questionnaire on E-learning skills for teaching and learning of core education courses", (QELSEC). The Questionnaire was validated by three research experts. It yielded a reliability coefficient of .76 through Cronbach's Alpha Method. Hanks answered research questions with mean and standard deviation while chi-squared statistic was used for hypotheses testing.

In major findings, Hanks identified, shearing screen on zoho, video expressions on zoho, muting options on zoho, and meeting calendar creation on zoho as vital E-learning skills needed for teaching and learning of core education courses in universities in Oklahoma, USA. According to Hanks, male and female respondents differed significantly in their responses. Female respondents favored the ICT competencies suggested in the study while their male counterparts did not. Hanks concentrated only on E-learning skills

unlike this study that covered four other ICT competences. Hanks covered the entire core Education course but this study focused on Educational Technology. Hanks tested hypotheses with chi-squared statistic but Z-test was used to test hypotheses in this study. On the other hand, Hanks's study was related to this study in content, design, instrumentation and statistical tools for answering research questions. Hence Hanks's work is very relevant to this study.

Dennis (2022) attempted to determine the Adequacy of E-learning competences possessed by students for effective learning of educational technology courses in Dundee, Scotland. EX-Post Facto research design was adapted for the study. The study was guided by seven research questions and five hypotheses. Population for the study was 11,312 university students studying Educational Technology and related courses in Dundee, Scotland. From this population, a sample of 2,225 students was drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire designed to collect data on the Adequacy of E-learning competences possessed by students for effective learning of educational technology courses in Dundee, Scotland. The instrument contained 50-items rated on 4-point scale: Very Adequate, Adequate, Inadequate, and Very Inadequate. Three research experts validated the questionnaire. It yielded a reliability coefficient of .91 obtained through Cronbach's Alpha method. Dennis answered research questions with mean and standard deviation but tested hypotheses with T-test statistic.

In major findings, Dennis reported that the students' E-learning competences were adequate for effective learning of educational technology courses. The adequacy was same for male and female students. Dennis was interested in Adequacy of competences possessed by the students whereas this study focused on the competencies needed for effective teaching and learning of educational technology courses. Dennis focused only on E-learning competences for effective learning of educational technology courses while this study was interested in five different ICT competencies for effective teaching and learning of educational technology courses. Dennis tested hypothesis with T-test statistic while z-test statistics was used for hypothesis testing in this study.

Dennis Adopted EX-Post Facto research design while descriptive survey research design was adopted for this study. Notwithstanding these differences, Dennis study and this study were related in many ways. In the first place, both studies were interested in E-learning competencies. Secondly, both studies adopted same sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Furthermore, both studies considered influence of respondents' gender. Consequently, Dennis study was consistent with this present one.

Studies on Artificial Intelligence (AI) Utilization Competencies Needed for Effective Teaching and Learning of Educational Technology Courses.

Sapre (2019), attempted to identify the Artificial Intelligence (AI) Utilization Competencies required for effective teaching and learning of educational technology courses in colleges and universities in South-South Geopolitical Zone. It was a descriptive survey research guided by three research questions and two hypotheses. Population for the study was 1,195 Educational technology lecturers in colleges and universities in South-South Geopolitical Zone. A Sample of 1,471 lectures was drawn from the population using cluster and simple random sampling techniques. A questionnaire titled "Questionnaire on Artificial Intelligence (AI) Utilization Competencies (QAIUC)" was constructed by the researcher and used for data collection in the study. The questionnaire was made up of 45 items and validated by five research experts. It yielded a reliability coefficient of .59 obtained through Cronbach's Alpha method. Research questions were answered with simple percentage while t-test statistic was used for hypotheses testing.

In the major findings, Sapre identified Educational chat bots, adaptive learning platforms, Ai-powered tutoring systems, automated writing assessment, and natural language processing tools as main Artificial Intelligence (AI) Utilization competencies required for effective teaching and learning of educational technology courses in colleges and universities in South-South Geopolitical Zone. According to Sapre, male and female

respondents differed significantly in their responses. Male respondents favored the ICT competencies articulated in the study while their female counterparts did not. Sapre's study was closely related to this study. In the first instance, Artificial Intelligence (AI) Utilization competencies required for effective teaching and learning of educational technology courses formed a major component of the content both studies covered. Also, both studies were interest in influence of gender of the respondents. However, Sapre's study was restricted to Artificial Intelligence (AI) Utilization competencies only while this study covered other ICT competencies such as (web-based, digital data processing, e-learning, and educational social media utilization competencies). Sapre answered research questions and tested hypotheses with simple percentage and t-test statistic respectively while this study used mean and standard deviation to answer research question and z-test for hypotheses testing. Sapre covered colleges and universities whereas this study was restricted to universities. Despite these differences, Sapre's study aided useful comparison and inferences in this study.

In a descriptive survey, Okeme (2019) investigated the extent of Artificial Intelligence (AI) Utilization Competencies possessed by university students for effective learning of educational technology courses in Kogi State. The study was guided by six research questions and six hypotheses. The population for the study was 2,550 university students, from which a sample of 89 students were drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire structured to collect data on the level of Artificial Intelligence (AI) Utilization Competencies possessed by university students for effective learning of educational technology courses in Kogi State. The questionnaire was made up of 60-items rated on 4-point scale: Very High Extent, High Extent, Low Extent, and Very Low Extent. Three research experts validated the questionnaire. It yielded a reliability coefficient of .89 obtained through Cronbach's Alpha method. Okeme answered research questions with mean and standard deviation but tested hypotheses with Analysis of Variance (ANOVA).

In major findings, Okeme reported that the students possessed low level of Artificial Intelligence (AI) Utilization Competencies, however the students could achieve effective learning of educational technology courses in Kogi State. Also, students in private universities possessed higher level of Artificial Intelligence (AI) Utilization Competencies than their counterparts in public universities in Kogi State. Okeme was interested in level of competencies possessed by the students whereas this study focused on the competencies needed by the students for effective learning of educational technology courses. Okeme focused only on Artificial Intelligence (AI) Utilization Competencies for effective learning of educational technology courses while this study was interested in five different ICT competencies for effective teaching and learning of educational technology courses. Okeme tested hypothesis with ANOVA while z-test statistics was used for hypothesis testing in this study. Okeme's hypothesis were based on public/private universities (school ownership) while hypothesis in this study were based on gender of respondents (male/female).

Notwithstanding these differences, Okeme's study and this study were related in many ways. In the first place, both studies were interested in Artificial Intelligence (AI) Utilization Competencies. Secondly, both studies adopted same research design and sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Consequently, Okeme's study was consistent with this present one.

Hamitton (2021) attempted to determine the Adequacy of Artificial Intelligence (AI) Utilization competences possessed by students for effective learning of educational technology courses in West London. EX-Post Facto research design was adapted for the study. The study was guided by four research questions and four hypotheses. Population for the study was 2,522 university students studying Educational Technology and related courses in West London. From this population, a sample of 338 students was drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire designed to collect data on the Adequacy of Artificial Intelligence (AI) Utilization competences possessed by students for effective learning

of educational technology courses in West London. The instrument contained 48-items rated on 4-point scale: Very Adequate, Adequate, Inadequate, and Very Inadequate. Three research experts validated the questionnaire. It yielded a reliability coefficient of .71 obtained through Cronbach's Alpha method. Wilson answered research questions with mean and standard deviation but tested hypotheses with T-test statistic.

In major findings, Hamitton reported that the students' Artificial Intelligence (AI) Utilization competences were adequate for effective learning of educational technology courses. The adequacy was same for male and female students. Hamitton was interested in Adequacy of competences possessed by the students whereas this study focused on the competencies needed for effective teaching and learning of educational technology courses. Hamitton focused only on Artificial Intelligence (AI) Utilization competences for effective learning of educational technology courses while this study was interested in five different ICT competencies for effective teaching and learning of educational technology courses. Hamitton tested hypothesis with T-test statistic while z-test statistics was used for hypothesis testing in this study. Hamitton Adopted EX-Post Facto research design while descriptive survey research design was adopted for this study. Notwithstanding these differences, Hamitton study and this study were related in many ways. In the first place, both studies were interested in Artificial Intelligence (AI) Utilization Competencies. Secondly, both studies adopted same sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Furthermore, both studies considered influence of respondents' gender. Consequently, Hamitton study was consistent with this present one.

Shirley (2021), conducted a descriptive survey in Finland, to identify Artificial Intelligence (AI) Utilization Competencies required for effective teaching and learning of educational technology courses. Sample for the study consisted of 98 lecturers and 1,310 undergraduates. Techniques used to draw the samples were stratified and simple random sampling techniques. Five research questions and five hypotheses guided the study. Instrument used for data collection was a 37-item questionnaire graded on a 4-

point scale. The questionnaire was validated by 3 research experts. It yielded a reliability coefficient of .89. Research question were answered with mean and standard deviation while z-test statistic was used for hypotheses testing.

In the major findings, Shirley reported that major Artificial Intelligence (AI) Utilization Competencies required for effective teaching and learning of educational technology courses in Finland include; reactive machines, limited memory, narrow AI, General AI, theory of mind and self-aware. According to Shirley, male and female respondents did not differ significantly in their ratings. Shirley's study was closely related to this study in so many ways. Foremost, both studies treated Artificial Intelligence (AI) Utilization Competencies required for effective teaching and learning of educational technology courses. Also, both studies had interest in influence of gender of the respondents, both adopted same design and same tools for data analyses. However, Shirley's study was restricted to Artificial Intelligence (AI) Utilization Competencies only while this study treated four more ICT competencies (web-based research, e-learning, artificial intelligence utilization and educational social media utilization competencies). Notwithstanding these differences, Shirley's study and findings aided inferences in this study.

Olusola (2021) conducted a descriptive survey research on Artificial Intelligence (AI) Utilization skills required for teaching and learning of core education courses in universities in Kwara State. Olusola formulated four research questions and four hypotheses. Stratified and simple random sampling techniques were used to draw a sample of 62 lecturers from a population of 139 as at the time of the study. Data were collected using a researcher-made questionnaire captioned "Questionnaire on Artificial Intelligence (AI) Utilization skills for teaching and learning of core education courses", (QDPEC). The Questionnaire was validated by three research experts. It yielded a reliability coefficient of .97 through Cronbach's Alpha Method. Olusola answered research questions with mean and standard deviation while chi-squared statistic was used for hypotheses testing.

In major findings, Olusola identified, adaptive learning platforms, General AI, theory of mind, natural language processing tools and self-aware as Artificial Intelligence (AI) Utilization skills needed for teaching and learning of core education courses in universities in Kwara State. According to Olusola, male and female respondents differed significantly in their responses. Female respondents favored the ICT competencies suggested in the study while their male counterparts did not. Olusola concentrated only on Artificial Intelligence (AI) Utilization skills unlike this study that covered four other ICT competences. Olusola covered the entire core Education course but this study focused on Educational Technology. Olusola tested hypotheses with chi-squared statistic but Z-test was used to test hypotheses in this study. On the other hand, Olusola's study was related to this study in content, design, instrumentation and statistical tools for answering research questions. Hence Olusola's work was very relevant to this study.

Studies on Educational Social Media Utilization Competencies Needed for Effective Teaching and Learning of Educational Technology Courses.

Brown (2020), attempted to identify the Educational Social Media Utilization competencies required for effective teaching and learning of educational technology courses in tertiary institutions in Central Wales, UK. It was a descriptive survey research guided by three research questions and two hypotheses. Population for the study was 396 Educational technology lecturers in tertiary institutions in North West Geopolitical zone. A Sample of 220 lectures was drawn from the population using cluster and simple random sampling techniques. A questionnaire titled "Educational Social Media Utilization Competencies Questionnaire (ESMUCQ)" was constructed by the researcher and used for data collection in the study. The questionnaire was validated by three research experts. It yielded a reliability coefficient of .64 obtained through Cronbach's Alpha method. Research questions were answered with mean and standard deviation while t-test statistic was used for hypotheses testing.

In the major findings, Brown identified Telegram, YouTube, Reddit, Messenger, Tumblr, Discord and Twitch as main Educational Social Media Utilization competencies required for effective teaching and learning of educational technology competencies in tertiary institutions in Central Wales, UK. According to Brown, male and female respondents differed significantly in favour of the male lecturers. Brown's study was closely related to this study. In the first instance, Educational Social Media Utilization competencies required for effective teaching and learning of educational technology courses formed a major component of the content both studies covered. Also, both studies were interest in influence of gender of the respondents, both adopted same design and same tools for answering research questions. However, Brown's study was restricted to Educational Social Media Utilization competencies only while this study covered other ICT competencies such as (web-based research, digital data processing, e-learning, and artificial intelligence utilization). Brown tested hypothesis with t-test but z-test was used for that purpose in this study. Brown covered tertiary institutions (Universities, polytechnics, colleges of education etc) whereas this study was restricted to universities. Despite these differences, Brown's study aided useful comparisons and inferences in this study.

In a descriptive survey, Audu (2018) investigated the level of Educational Social Media Utilization competencies possessed by university lecturers for effective teaching of educational technology courses in Bauchi State. The study was guided by five research questions and five hypotheses. The population for the study was 2,756 university lecturers, from which a sample of 105 lecturers (39 males and 66 females) were drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire structured to collect data on the level of Educational Social Media Utilization competencies possessed by university lecturers for effective teaching of educational technology courses in Bauchi State. The questionnaire was made up of 25-items rated on 4-point scale: Very High, High, Low, Very Low. Three research experts validated the questionnaire. It yielded a reliability coefficient of .76 obtained through Cronbach's Alpha method. Audu

answered research questions with mean and standard deviation but tested hypotheses with Analysis of Variance (ANOVA).

In major findings, Audu reported that the lecturers possessed low level of Educational Social Media Utilization competencies but they could teach educational technology courses effectively. Also, lecturers in private universities possessed higher level of Educational Social Media Utilization competencies than their counterparts in public universities in Bauchi State. Audu was interested in level of competencies possessed by the lecturers whereas this study focused on the competencies needed by the lecturers for effective teaching of educational technology courses. Audu focused only on Educational Social Media Utilization competencies for effective teaching of educational technology courses while this study was interested in five different ICT competencies for effective teaching and learning of educational technology courses.

Audu tested hypothesis with ANOVA while z-test statistics was used for hypothesis testing in this study. Audu's hypothesis were based on public/private universities (school ownership) while hypothesis in this study were based on gender of respondents (male/female). Notwithstanding these differences, Audu's study and this study were related in many ways. In the first place, both studies were interested in Educational Social Media Utilization competencies. Secondly, both studies adopted same research design and sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Consequently, Audu's study was consistent with this present one.

Dunga (2020) attempted to determine the Adequacy of Educational Social Media Utilization competences possessed by students for effective learning of educational technology courses in Northern Namibia. EX-Post Facto research design was adapted for the study. The study was guided by ten research questions and ten hypotheses. Population for the study was 2,120 university students studying Educational Technology and related courses in Northern Namibia. From this population, a sample of 938 students was drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection was a questionnaire designed to

collect data on the Adequacy of Educational Social Media Utilization competences possessed by students for effective learning of educational technology courses in Northern Namibia. The instrument contained 64-items rated on 4-point scale: Very Adequate, Adequate, Inadequate, and Very Inadequate. Three research experts validated the questionnaire. It yielded a reliability coefficient of .91 obtained through Cronbach's Alpha method. Dunga answered research questions with mean and standard deviation but tested hypotheses with T-test statistic.

In major findings, Dunga reported that the students' utilization of Educational Social Media competences were adequate for effective learning of educational technology courses. The adequacy was same for male and female students. Dunga was interested in Adequacy of competences possessed by the students whereas this study focused on the competencies needed for effective teaching and learning of educational technology courses. Dunga focused only on Educational Social Media Utilization competences for effective learning of educational technology courses while this study was interested in five different ICT competencies for effective teaching and learning of educational technology courses. Dunga tested hypothesis with T-test statistic while z-test statistics was used for hypothesis testing in this study.

Dunga Adopted EX-Post Facto research design while descriptive survey research design was adopted for this study. Notwithstanding these differences, Dunga study and this study were related in many ways. In the first place, both studies were interested in Educational Social Media Utilization competencies. Secondly, both studies adopted same sampling techniques. Moreso, statistical tools for answering research questions in both studies were similar. Furthermore, both studies considered influence of respondents' gender. Consequently, Dunga study was consistent with this present one.

Eze (2018), conducted a descriptive survey in Singapore to identify Educational Social Media Utilization competencies required for effective teaching and learning of educational technology courses. Sample for the study consisted of 150 lecturers and 1,405 undergraduates. Techniques used to draw the samples

were stratified and simple random sampling techniques. Four research questions and five hypotheses guided the study. Instrument used for data collection was a 77-item questionnaire graded on a 4-point scale. The questionnaire was validated by 3 research experts. It yielded a reliability coefficient of .83. Research question were answered with mean and standard deviation while z-test statistic was used for hypotheses testing.

In the major findings, Eze reported that major Educational Social Media Utilization competencies required for effective teaching and learning of educational technology courses include; proficiency in whatsApp, X, Skype, Facebook, We-chart, Sharechat, Instagram, Printerest, Weibo, Threads, and LinkedIn. According to Eze, male and female respondents did not differ significantly in their ratings. Eze's study was closely related to this study in so many ways. Foremost, both studies treated Educational Social Media Utilization competencies required for effective teaching and learning of educational technology courses. Also, both studies had interest in influence of gender of the respondents, both adopted same design and same tools for data analyses. However, Eze's study was restricted to Educational Social Media Utilization competencies only while this study treated four more ICT competencies (web-based research, digital data processing, e-learning, and artificial intelligence utilization competencies). Notwithstanding these differences, Eze's study and findings aided inferences in this study.

Lee (2020) conducted a descriptive survey research on Educational Social Media Utilization skills required for teaching and learning of core education courses in universities in Singapore. Lee formulated seven research questions and seven hypotheses. Stratified and simple random sampling techniques were used to draw a sample of 46 lecturers from a population of 97 as at the time of the study. Data were collected using a researcher-made questionnaire captioned "Questionnaire on Educational Social Media Utilization skills for teaching and learning of core education courses", (QESMUS). The Questionnaire was validated by three research experts. It yielded a reliability coefficient of .78 through Cronbach's Alpha Method. Lee answered research questions with

mean and standard deviation while chi-squared statistic was used for hypotheses testing.

In major findings, Lee identified, Quora, Line, TikTok, Snapchat, etc as vital Educational Social Media Utilization skills needed for teaching and learning of core education courses in universities in Singapore. According to lee, male and female respondents differed significantly in their responses. Female respondents favored the ICT competencies articulated in the study while their male counterparts did not. Lee concentrated only on Educational Social Media Utilization skills unlike this study that covered four other ICT competences. Lee covered the entire core Education course but this study focused on Educational Technology. Lee tested hypotheses with chi-squared statistic but Z-test was used to test hypotheses in this study. On the other hand, Lee's study was related to this study in content, design, instrumentation and statistical tools for answering research questions. Hence Lee's work was very relevant to this study.

Studies on Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses.

Visaq (2020), conducted a descriptive survey in Central District of India to identify Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses in tertiary institutions. Sample for the study consisted of 331 lecturers and 2,592 students drawn from sampled tertiary institutions in Central District of India. Techniques used to draw the samples were cluster, proportionate and simple random sampling techniques. Three research questions and five hypotheses guided the study. Instrument used for data collection was a questionnaire graded on a 4-point scale. The questionnaire had 36 items. It was validated by 3 research experts. It yielded a reliability coefficient of .80. Research question were answered with mean and standard deviation while z-test statistic was used for hypotheses testing.

In the major findings, Visaq reported that the Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses in tertiary institutions in Central India include; **Certification programs in ICT pedagogy**, **Online self-paced courses**, **Faculty exchange programs**, **ICT-focused research grants**, **Institutional ICT policy frameworks** and **Performance evaluation metrics**. According to Visaq, male and female respondents did not differ significantly in their ratings. Visaq's study is closely related to this study in so many ways. Foremost, both studies treated Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses. Also, both studies had interest in influence of gender of the respondents, both adopted same design and same tools for data analyses. However, Visaq's study was restricted to Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses while this study treated ICT competencies (web-based research, digital data processing, e-learning, artificial intelligence utilization and educational social media and utilization competencies) in addition to suggestions for enhancing the acquisition of ICT competencies. Also visaq's study covered all tertiary institutions while this study concentrated only on universities. Despite these differences, Visaq's study and findings aided inferences in this study.

In Edo state Nigeria, Eremose (2020) conducted a study to determine the Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses in colleges of education. Eremose adopted descriptive survey design for the study. Five research questions and five hypotheses guided the study. Eremose drew a sample of 337 respondents made up of 22 lecturers and 315 students from colleges of education in Edo state, Nigeria. Techniques used to draw the samples were proportionate and simple random sampling techniques. Instrument used for data collection was a 4-point questionnaire with 28 items. The questionnaire was validated by 3 research experts. It yielded a reliability coefficient of

.93 using Cronbach's Alpha method. Research question were answered with mean and standard deviation while t-test statistic was used for hypotheses testing.

In the major findings, Eremose reported that the Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses in colleges of education in Edo state, Nigeria include; **Integrating ICT into lesson planning, Adopting blended learning models, Project-based learning with ICT tools**, **Peer-to-peer mentoring**, **Microteaching with ICT integration**, **Provision of modern ICT facilities**, **Establishing ICT resource centers**, **Regular system upgrades**, **Technical support units**, **Open-source software adoption**, **Continuous professional development workshops**, **Certification programs in ICT pedagogy** and **Online self-paced courses**. According to Eremose, male and female respondents differed significantly in their ratings with female respondents supporting the strategies more than their male counterparts. Eremose's study is closely related to this study in so many ways. First, both studies treated Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses. Also, both studies had interest in influence of gender of the respondents, both studies adopted same design, similar sample and same tools for answering research questions. On the other hand, Eremose tested hypotheses with t-test statistic while hypotheses' testing in this study was done with z-test statistic. Eremose's study was restricted to Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses while this study treated ICT competencies (web-based research, digital data processing, e-learning, artificial intelligence utilization and educational social media and utilization competencies) in addition to suggestions for enhancing the acquisition of ICT competencies. Eremose studied teaching and learning of educational technology courses in colleges of education while this study focused on teaching and learning of educational technology courses in universities. Yet, Eremose's study and findings aided inferences in this study.

In a descriptive survey, George (2021) investigated the Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses in universities in Northern Zimbabwe. Sample for the study consisted of 108 lecturers and 625 undergraduates drawn from universities in Northern Zimbabwe. Techniques used to draw the samples were stratified, proportionate and simple random sampling techniques. Four research questions and four hypotheses guided the study. Instrument used for data collection was a questionnaire constructed by the researcher and was validated by 3 research experts. The questionnaire had 40 items graded on a 4-point scale. It yielded a reliability coefficient of .87. Research question were answered with mean and standard deviation while z-test statistic was used for hypotheses testing.

In the major findings, George reported that the Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses in universities in Northern Zimbabwe include; **Open-source software adoption**, **Continuous professional development workshops**, **Certification programs in ICT pedagogy**, **Online self-paced courses**, **Faculty exchange programs**, **ICT-focused research grants**, **Institutional ICT policy frameworks**, **Performance evaluation metrics**, **Incentives for ICT adoption**, **Curriculum redesign** and **Partnerships with tech companies**. According to George, male and female respondents differed significantly in their ratings in favour of male respondents who rated the suggestions very high in contrast with their female counterparts who rated the suggestions very low. George's study is closely related to this study in so many ways. In the first instance, both studies treated Strategies for enhancing the Acquisition of ICT competencies by lecturers and students for Effective Teaching and Learning of Educational Technology Courses. Secondly, both studies had interest in influence of gender of the respondents. Also, both studies adopted same design and same tools for data analyses. Both studies were conducted in universities. In contrast, George's study was restricted to Strategies for enhancing the Acquisition of ICT competencies by lecturers and

students for Effective Teaching and Learning of Educational Technology Courses while this study treated ICT competencies (web-based research, digital data processing, e-learning, artificial intelligence utilization and educational social media and utilization competencies) in addition to suggestions for enhancing the acquisition of ICT competencies. Notwithstanding these differences, George's study and findings aided inferences in this study.

CHAPTER 25

Topic:

STUDY SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED ACADEMIC PERFORMANCE IN COMPUTER STUDIES IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Studies on Reading Skills

Cherry (2018) conducted a descriptive survey in Northern Ireland, United Kingdom to investigate the relevance of reading as study skills for improving students' performance in computer studies. 3,116 high school students were drawn from 32 high schools and used as sample for the study. Technique used was simple random sampling. Four research questions and four hypotheses guided the study. Instrument used for data collection was a 22-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while regression analysis was used for hypotheses testing. Cherry reported that reading skills were very relevant to a great extent for improving the performance of high school students in computer studies in Northern Ireland. The performance of female students was reported to have been influenced more than those of their male counterparts. Cherry's study is closely related to this study in so many ways. Foremost, both studies treat the same variables (reading skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this present study addresses other study skills unlike Cherry's work that focused only on reading skills. Also, Cherry tested hypotheses with regression analysis while this study used z-test statistic. Notwithstanding, Cherry's study and findings aided inferences in this study.

Zico (2021) investigated study skills use among computer science students in selected Switzerland colleges. Zico adopted a

descriptive survey design. Six research questions and six hypotheses guided the study. A 25-item structured questionnaire was used for data collection. The questionnaire was validated by three research experts and had a reliability coefficient of 0.62. It was scored on a five-point scale. Mean, standard deviation and chi-square were used for data analyses. In the major findings, Zico reported that the study skills of the sampled students did not make any significant impact on their academic performance. The situation was same for public and private schools students. Zico's study is consistent with this study though Zico compared study skills on public school students with those of private schools while this study is interested in gender. Zico used chi-square to test hypotheses but this study used z-test statistic. Zico focused on general academic performance while this study focused on performance in computer studies. However, Zico's study was very useful to this study, especially in interpretation of results.

Babalola (2019) conducted a descriptive survey aimed at ascertaining the extent to which secondary school students need reading skills for improved academic performance in Abiokuta, Ogun state. 472 secondary school students were drawn from 12 secondary schools in Abiokuta and used as sample for the study. Technique used was simple random sampling. Two research questions and two hypotheses guided the study. Instrument used for data collection was a 16-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while t-test was used for hypotheses testing. In major findings, Babalola reported that reading skills were very important in improving the performance of secondary school students. Performance of the students were influenced equally, hence, no significant difference between male and female students.

Babalola's study is closely related to this present study in so many ways. Foremost, both studies treated the same variables (reading skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this present study addressed other reading skills unlike Babalola's work that focused only on reading skills and same respondents (students). Also, Babalola tested hypotheses with

t-test while this study used z-test statistic. Despite these differences, Babalola's findings was useful in this study.

Dickson (2016) attempted to determine teachers' perception of study skills needed by high school students for learning computer studies in Ohio, United States of America. Descriptive survey was adopted as design of the study. Six research questions and six hypotheses guided the study. A sample of 268 teachers was drawn from 136 high schools in Ohio, United States of America. The sample consisted of 81 teachers from female high schools and 187 from male high schools. Proportionate and simple random sampling techniques were used to draw the sample. A 30-item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher. It was graded using a 4-point scale. Mean was used to answer all the research questions. Hypotheses were tested at 0.05 level of significance using Analysis of Variance (ANOVA).

Major findings of Dickson's study revealed that the study skills needed by the students as perceived by their teachers included; reading, concentration, time management, note taking and preparation for examination skills. Female high school teachers perceived the need for these skills more than their male counterparts. Dickson's study and this present work are very closely related. Both studies treated the same variables (study skills and gender), adopted same design, used similar respondents and scored their responses same way. On the other hand, they differ in data analyses. Dickson answered research questions with mean only, but this study used mean and standard deviation. Dickson tested hypotheses with ANOVA but this study used z-test statistic. Interestingly, the five study skills perceived to be important by Dickson's respondents were the same study skills that formed the crux of this present study. Thus, Dickson's study is very useful in discussing findings of this present study, where useful comparisons were made.

Studies on Concentration Skills

On concentration skills, Tsui (2022) in a descriptive survey guided by three research questions and three hypotheses sought to examine the extent of students' concentration skills affect their

academic performance in selected courses in Indian colleges. Simple random sampling and proportionate sample techniques were combined in drawing a sample of 386 students. 200 of the students were drawn from rural colleges while 268 were drawn from colleges in urban locations. An 18-item structured questionnaire was used for data collection. The questionnaire was validated by experts and it had a reliability coefficient of 0.87. Simple percentage was used to answer the research questions. Two-way ANOVA was used for testing the hypotheses. Major findings of the study revealed that the students' concentration skills did not significantly affect their performance in computer science. Urban schools' students adopted concentration skills more than their rural schools' counterparts. Tsui did not cover all the skills in studying covered in this present study. Tsui used different statistical tools for data analyses from the ones used in this study. Tsui was concerned with school location whereas this study is concerned with gender, yet Tsui's study is very useful to this study. The aspect of study skills (concentration skill) covered by Tsui is a component of this study, thus, both studies are very much related.

In another Asian country, Lee (2020) undertook a study to determine the need for concentration skills among secondary school students in Central Singapore. The design for the study was a combination of expo-facto and a descriptive survey. Six research questions and eight hypotheses guided the study. A 15-item checklist was used to collect data. A sample of 5000 students was drawn for the study. To do this, purposive sampling technique was used. Out of the 5000 students, 2800 were females and 2200 were males. Mean and standard deviation were used to answer the research questions while hypotheses were tested with Analysis of Variance (ANOVA) at 0.05 level of significance. Lee reported that concentration skills were highly needed by the students. Male students valued the skills more than their female counterparts. Lee's study differed from this present study in choice of design where Lee combined Expo-facto and survey but this study adopted only descriptive survey design. Instruments for data collection in Lee's study was Checklist while questionnaire was used in this study. Lee also differed in statistical tool for data analyses. However, Lee's

study and this present study relate very well in some aspects. Concentration skills covered in Lee's work is part of this study. More-so, Lee considered gender influence as done in this study. Therefore, Lee's study aided conclusions that was made in this study.

Rex (2019) sought to determine teachers' perception of study skills needed by secondary school students for learning computer studies in Cape-Town, South Africa. Descriptive survey was adopted as design of the study. Two research questions and two hypotheses guided the study. A sample of 228 teachers was drawn from 84 secondary schools in Cape-Town, South Africa. The sample consisted of 87 female teachers and 141 male teachers. Proportionate and simple random sampling techniques were used to draw the sample. A 25-item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher. It was graded using a 4-point scale. Mean and standard deviation was used to answer all the research questions. Hypotheses were tested at 0.05 level of significance using z-test statistic.

Major findings of Rex's study revealed that male teachers perceived that secondary school students needs concentration, reading and time management skills for improved academic performance in computer studies while their female counterparts perceived the contrary so as to perform maximally in computer studies. Rex's study and this present work are very closely related. Both studies treated the same variables (study skills and gender), adopted same design, used similar respondents and scored their responses same way. Also, both studies used same tools for data analyses. Moreso, three out of the five study skills were perceived to be important by Rex's respondents are among the indices treated in this study. Thus, Rex's study was very useful in discussing findings of this study.

Amawo (2018) conducted a descriptive survey with the aim of establishing the extent to which study skills are needed for improving students' performance in computer studies in Obudu, Cross River state. 312 secondary school students drawn from 9 secondary schools in Obudu was used as sample for the study. Amowo used simple random sampling techniques to draw the

sample. Three research questions and three hypotheses guided the study. Instrument used for data collection was a questionnaire made up of 20-item and graded on a 4-point scale. Research questions were answered with mean and standard deviation while chi-squared was used for hypotheses testing. Amawo reported in key findings that study skills (reading, time management, concentration, preparation for examination and note taking) is to a very great extent in improving the performance of secondary school students in computer studies. Performance of the male and female were rated equally. Amawo's study is closely related to this present study in so many ways. First, both studies treated the same variables (study skills and influence of gender). Moreso, both studies adopted same design and same statistical tools for answering research questions. Also, Amawo tested hypotheses with chi-squared while this study used z-test statistic. Notwithstanding these differences, Amawo's findings guided inferences in this study.

Studies on Note Taking Skills

In a descriptive survey, Walter (2020) worked on need for enhancing secondary school students' academic performance through note taking skills in Nairobi Kenya. Four research questions and four hypotheses guided the study. A structured questionnaire made up of 24 items, scored on a 4-point scale was used for data collection. Questionnaire copies were distributed to respondents directly and collected back same way. A sample of 60 students was drawn by stratified simple random sampling techniques and used for the study. Data collected were analyzed using mean and z-test statistics. Mean was used to answer the research questions while z-test statistics was used to test the hypotheses at 0.05 level of significance. According to Walter, findings of the study showed that note taking skills were highly needed for enhancing secondary school students' academic performance in computer science in Nairobi, Kenya. Male and female teachers did not differ in their perception with respect to the study skill (note taking skill) needed by male and female secondary school students for improved academic performance in computer studies.

This present study is wider in scope as it treated other skills (reading, concentration, time management and preparation for examination skills) unlike Walter's study which was concerned only with note taking skills. Walter used only mean to answer research questions whereas this study used mean and standard deviation to answer research questions. Yet, Walter's study is very consistent with this study and is very useful in drawing rational conclusions as both studies treated note taking skills and gender influence as variables.

Kyap (2019) conducted a descriptive survey in Mid-west Rwanda to ascertain the efficacy of note taking skills for improving secondary school students' academic performance. 316 students were drawn from 40 secondary schools and used as sample for the study. Technique used was simple random sampling. Five research questions and five hypotheses guided the study. Instrument used for data collection was a 32-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while regression analysis was used for hypotheses testing. Kyap reported that note taking skills significantly improved the performance of secondary school students in computer studies to a great extent. Female students were reported to have been influenced more than their male counterparts. Kyap's study is closely related to this study in so many ways.

Both studies treated the same variables (note taking skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this study addressed other study skills unlike Kyap's work that focused only on note taking skills. Also, Kyap tested hypotheses with regression analysis while this study used z-test statistic. Furthermore, Kyap used same respondents (students) as this study. Notwithstanding, Kyap's study and findings aided inferences in this study.

Umar (2018) investigated the effect of note taking skills on students' academic performance in computer studies in Bichi Education District of Kano State. Umar adopted a descriptive survey design. Five research questions and five hypotheses guided the study. A 17-item structured questionnaire was used for data

collection. The questionnaire was validated by three research experts and had a reliability coefficient of 0.86. Mean, standard deviation and t-test were used for data analyses. In the major findings, Umar reported that the note taking skills of the sampled students did not make any significant impact on their academic performance. The situation was same for public and private schools students. Umar's study is consistent with this study though Umar compared effect of note taking skills on public school students with those of private schools while this study was interested in gender. Umar used t-test to test hypotheses but this study used z-test statistic. Umar treated only note taking skills while this study added four more study skills. Also, Umar focused on general academic performance while this study focused on academic performance in computer studies. However, Umar's study was very useful to this study, especially in interpretation of results.

Yancho (2023) conducted an ex-post facto study to investigate impact of note taking skills on students' performance in core sciences in North Eastern District of Namibia. Three research questions and three hypotheses guided the study. A sample of 1,280 secondary school students was drawn. Purposive random sampling techniques was used to draw the sample. The sample consisted 580 male students and 700 female students. A 23-item structured questionnaire was used for data collection. The instrument was constructed by the researcher, validated by three research experts and had a reliability coefficient of 0.71. Mean and standard deviation were used to answer research questions while test of hypotheses was done using chi-square at .05 significant level. In the major findings, Yancho reported that note taking skills of the sampled students made significant impact in their performances in core sciences to a low extent. The impact was higher on male students than their female counterparts. Yancho used chi-square to test hypotheses but this study shall use z-test statistic. Yancho adopted Expo facto design while this study shall adopt descriptive survey.

Yancho treated only note taking skills while this study treated four more aspects of study skills in addition to note taking skills. Yancho was interested in core sciences but this study focused

on computer studies. However, Yancho's study and this present one treated same variables (note taking skills and gender influence) and answered research questions with the same tools (mean and standard deviation). Consequently, Yancho's study was very useful to this study, especially in interpretation of results.

Studies on Time Management Skills

On time management skills, Zadan (2018) in a descriptive survey guided by four research questions and four hypotheses sought to examine the extent to which students' time management skills influence their academic performance in Istanbul, Turkey. Stratified and simple random sampling techniques were combined in drawing a sample of 168 students. 78 of the students were males while 90 were females. A 28-item structured questionnaire was used for data collection. The questionnaire was validated by five experts and yielded a reliability coefficient of 0.78. Mean was used to answer the research questions. t-test statistic was used for testing the hypotheses. Major findings of the study revealed that the students' time management skills influenced their performance in computer studies to a low extent. It was same for both male and female students. Zadan did not cover all the study skills covered in this present study. Zadan used different statistical tools for data analyses. Zadan's study and this present study treated influence of gender. Also, both studies adopted same design. The aspect of study skills (time management skills) covered by Zadan was a component of this study, thus, they are very much related.

Charles (2019) investigated the consequence of inappropriate time management skills on students' academic performance in Michigan, USA. Charles adopted a descriptive survey design. Six research questions and six hypotheses guided the study. A 22-item structured questionnaire was used for data collection. The questionnaire was validated by three research experts and had a reliability coefficient of 0.72. It was scored on a five-point scale. Mean, standard deviation and chi-square were used for data analyses. In the major findings, Charles reported that the time management skills of the sampled students were rated to a low extent for promoting their academic performance. This was same for

both male and female students. Charles's study is consistent with this study. Both studies were interested in time management skills and influence of gender. Charles used chi-square to test hypotheses but this study used z-test statistic. Charles treated only time management skills while this study treated four more indices of study skills. However, Charles's study was very useful to this study, especially in interpretation of results.

Zippoh (2019) conducted a descriptive survey aimed at ascertaining teacher's perception of influence of time management skills on students' academic performance in Onterio, Canada. 10 research questions and 15 hypotheses guided the study. An on-line questionnaire made up of 114 items, scored on a 5-point scale was used for data collection. Responses were collected on-line from 1500 teachers. Mean and standard deviation were used to answer the research questions while Analysis of Variance (ANOVA) was used to test the hypotheses at 0.05 significant level. Zippoh reported that teachers perceived a very high positive influence of time management skills on students' academic performance. Also, male teachers were reported to have perceived a higher need for time management skills than their female counterparts.

A major limitation of Zippoh's work was certifying the true identity of the subjects, that is, the respondents. This was because responses were collected on-line and the chances of non-teachers responding to the instrument were high. Zippoh's work is consistent with this present study. Both studies addressed time management skills, academic performance and influence of gender. Both studies used teachers as respondents. However, this study covered more variables with respect to number of study skills addressed. Both studies also differed slightly in the choice of tools for data analyses with respect to hypotheses' testing. The on-line questionnaire limitation in Zippoh's study was corrected in this study where data collection was done physically, hence, ensuring that only appropriate persons responded to the questionnaire.

Vasco (2019) sought to determine extent to which study skills are needed by high school students for learning computer studies in Helsinki, Finland. Descriptive survey was adopted as design of the study. Six research questions and six hypotheses

guided the study. A sample of 182 students was drawn from sampled high schools in Helsinki, Finland. The sample consisted of 112 female and 70 male students. Proportionate and simple random sampling techniques were used to draw the sample. A 32-item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher. It was graded using a 4-point scale. Mean and standard deviation was used to answer the research questions. Hypotheses were tested at 0.05 level of significance using z-test statistic. Major findings of Vasco's study revealed that the study skills needed by the students included; reading, concentration, note taking and preparation for examination skills. Male students rated these skills to a very great extent than their female counterparts. Vasco's study and this present work are closely related. Both studies treated the same variables (study skills and gender), adopted same design, used similar respondents and scored their responses same way. Also, both studies used same tools for data analyses. Thus, Vasco's study was very useful in discussing findings of this study, where useful comparison were made.

Okeke (2023) conducted a descriptive survey to ascertain the effectiveness of time management skills of students as perceived by teachers for improved academic performance in computer studies in Afikpo Ebonyi State. 252 secondary school students drawn from 8 secondary schools in Afikpo was used as sample for the study. Simple random sampling techniques was used to draw the sample. Two research questions and two hypotheses guided the study. Instrument used for data collection was a questionnaire made up of 15-items and graded on a 4-point scale. Research questions were answered with mean and standard deviation while t-test was used for hypotheses testing. Okeke reported in major findings that time management skills were very effective in improving the academic performance of secondary school students in computer studies. Also, there was no significant difference between the perceptions of male and female teachers with respect to the study skills needed by secondary school students for improved academic performance in computer studies.

Okeke's study and this present one treated the same variables (time management skills and influence of gender). Also,

both studies adopted same design and same statistical tools for answering research questions. On the other hand, this present study addressed four other study skills in addition to time management skills treated by Okeke. Also, Okeke tested hypotheses with t-test while z-test statistic was used in this study. Notwithstanding, Okeke's findings guided inferences in this study.

Studies on Preparation for Examination Skills

Al-Jaradeen (2021) undertook a survey to examine the correlation between preparation for examination skills and students' academic performance in computer studies in New Delhi, India. Three research questions and three hypotheses guided the study. Design for the study was correlational design. A sample of 600 respondents was drawn by purposive sampling techniques. The sample was made up of 360 males and 240 female students. A 30-item questionnaire was used for data collection. Mean and standard deviation were used to answer the research question while Person's correlation was used to test hypotheses. Al-Jaradeen's finding showed that preparation for examination skills improved students' academic performance in computer to a great extent. The improvement was same for male and female students. Al-Jaradeen's study is consistent with this study in many areas. They both focused on preparation for examination skills, students' academic performance in computer studies, same respondents and influence of gender. Al-Jaradeen's study and this present study differed in design and statistical tools for data analyses. Al-Jaradeen studied only preparation for examination skills while this study covered four more components of study skills. Nevertheless, Al-Jaradeen's work aided suggestions in this study.

Jumoh (2019) undertook a study to determine the need for preparation for examination skills as perceived by teachers among high school students in Scotland. The design for the study was a combination of expo-facto and a descriptive survey. Two research questions and four hypotheses guided the study. A 44-item checklist was used to collect data. A sample of 3000 students was drawn for the study. To do this, purposive sampling technique was used. Out of the 3000 students, 1800 were females and 1200 were males. Mean

and standard deviation were used to answer the research questions while hypotheses were tested with Analysis of Variance (ANOVA) at 0.05 level of significance. Jumoh reported that found that male teachers perceived that secondary school students needs preparation for examination skills for improved academic performance in computer studies than their female counterparts.

Jumoh's study differed from this present study in choice of design where Jumoh combined Expo-facto and survey but this study adopted only descriptive survey design. Instrument for data collection in Jumoh's study was Checklist while questionnaire was used in this study. Jumoh also differed in statistical tool for data analyses. However, Jumoh's study and this present study relate very well in some aspects. Preparation for examination skills covered in Pedro's work is part of this study. More-so, Jumoh considered gender influence as done in this study. Therefore, Jumoh's study aided decisions that were made in this study.

Becky (2019) worked on need for enhancing secondary school students' computer studies academic performance through preparation for examination skills in Pretoria, South Africa. Descriptive survey was adopted as design of the study. Four research questions and eight hypotheses guided the study. A sample of 53 students was drawn by cluster and simple random sampling techniques and used for the study. A structured questionnaire made up of 17 items, scored on a 4-point scale was used for data collection. The instrument was constructed by the researcher, validated by three research experts and yielded a reliability coefficient of .69. Mean was used to answer the research questions while z-test statistics was used to test the hypotheses at 0.05 level of significance. According to Becky, findings of the study showed that preparation for examination skills needed for enhancing secondary school students' performance in computer studies in Pretoria, South Africa is to a very great extent.

Male and female students did not differ significantly in their ratings in Becky's study. This present study is wider in scope as it treated other indices of study skills unlike Becky's study which was concerned only with preparation for examination skills. Becky used only mean to answer research questions whereas this study used

mean and standard deviation to answer research questions. Yet, Becky's study is very consistent with this study and is very beneficial in drawing rational conclusions as both studies treated preparation for examination skills and gender influence as variables.

Akan (2020) conducted a descriptive survey aimed at discovering the teachers' perception on preparation for examination skills in refining students' academic performance in computer studies in Ikwere, River State. 312 secondary school students were drawn from 12 secondary schools in Ikwere and used as sample for the study. Technique used was simple random sampling. Two research questions and three hypotheses guided the study. Instrument used for data collection was a 14-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while t-test was used for hypotheses testing. In major findings, Akan reported that female teachers perceived that secondary school students need preparation for examination skills to perform maximally in computer studies while their male counterparts perceived that secondary school students need time management, concentration, note taking and reading skills for improved academic performance in computer studies.

Akan's study is closely related to this present study in so many ways. Both studies treated the same variables (preparation for examination skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this present study addressed other study skills unlike Akan's work that focused only on preparation for examination skills. Also, Akan tested hypotheses with t-test while z-test statistic was used in this study. Not minding these differences, Akan's findings supported inferences in this study.

CHAPTER 26

Topic:

TECHNOLOGY AND ENHANCEMENT OF EDUCATIONAL MANAGEMENT PRACTICES IN SECONDARY SCHOOLS IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Studies on Technology and Enhancement of Educational Management Practices of Planning in secondary schools

King (2021) attempted to determine the extent to which technology enhances planning practices among principals in American high schools, USA. Descriptive survey was adopted as design of the study. Six research questions and six hypotheses guided the study. A sample of 68 high school principals was drawn from all high school principals in Ohio, United States of America. The sample consisted of 40 principals of private schools and 28 from public high schools. Proportionate simple random sampling techniques was used to draw the sample. A 30 item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher using a 4-point likert scale. Mean was used to answer all the research questions. Hypotheses were tested at 0.05 level of significance using chi-square statistics.

Major findings of King's study revealed that technology enhanced planning practices among high school principals to a great extent. Private high schools principals were found to rate it more than their counterparts in the public high schools. King's study and this present work are very closely related. Both studies treated the same variables, adopted same design, used similar subjects and scored their responses same way. However, they differ in data analyses. King answered research questions with mean only but this study shall do so with mean and standard deviation. King tested hypotheses using chi-square but this study shall use z-test statistics.

Notwithstanding, King's study shall be very useful in discussing findings of this study, where useful comparison shall be made.

Ekebe (2022) studied the influence of technology enhancement in planning of managerial practices by principals of secondary schools in Cross River state. 108 respondents were drawn as sample for the study. The respondents were made up of 62 public secondary school principals and 46 private secondary school principals. Three research questions and three hypotheses guided the study. A structured questionnaire made up of 40 items was used for data collection. Research questions were answered using mean while chi-square was used to test the hypotheses. Ekebe reported in his findings that enhancement of technology in planning of managerial practices by principals was a very great extent. Also public secondary school principals and private secondary school principals did not differ significantly in their ratings. Though Ekebe tested hypotheses with chi-square, the study is closely related to this present study in many ways. Both studies are concerned with enhancement of technology to educational management. Both studies have secondary school principals as subjects. Both studies are designed alike. Thus, Ekebe's findings shall be of immense benefit to this study.

In a descriptive survey, Adeleke (2021) examined the role of technology in improving planning managerial practices by secondary school administrators in Ondo state. Four research questions and four hypotheses guided the study. A structured questionnaire made up of 24 items, scored on a 4-point Likert scale was used for data collection. Questionnaire copies were distributed to respondents directly and collected back same way. A sample of 56 secondary school principal was drawn by stratified simple random sampling techniques and used for the study. Data collected were analyzed using mean and Z-test statistics. Mean was used to answer the research questions while Z-test was used to test the hypotheses at 0.05 level of significance.

According to Adeleke, findings of the study showed that school administrators remained undecided and neutral on how technology would enhance educational management practices in

secondary schools. Also female school administrators improved better than their male counterparts in the study. Adeleke's study was wider in scope as it treated the both the concept of technology and educational management practices (planning practices). Adeleke was concerned with influence of gender and only mean statistics was used to answer research questions unlike this study that is concerned with school ownership and in addition to mean statistics, standard deviation shall be used to answer research questions. Yet, Adeleke's study is very consistent with this study and shall be very useful in drawing rational conclusions.

Ikechi (2021) in descriptive survey to ascertain the extent to which technology is utilized in enhancing planning practices in secondary schools in Umunneochi Local Government Area of Abia State. Three research questions and three hypotheses guided the study. A sample of 28 secondary school principals was drawn from Umunneochi Local Government Area of Abia State. The sample consisted 14 principals from public and 14 principals from private secondary schools. Purposive random sampling techniques was used to draw the sample. ICT Literacy test (ILT) made up of thirty objective questions was used for data collection. The instrument yielded a reliability coefficient of 0.71 in a trial test. Mean and standard deviation were used to analyze the scores. Ikechi reported that utilization of technology in enhancing planning practices in secondary schools was very low.

Also most of the principals were rated very low in planning managerial practices. Private schools' principals utilized planning managerial practices and were rated higher than their counterparts in the public schools. Ikechi's study and this study are closely related. However, Ikechi used a different design, used two instruments, smaller sample. Yet, Ikech's study is very useful and veritable for gaining more insights into the topic of discourse. Ikechi's findings shall also be considered in the discussion of finding of this study where objective comparisons shall be made.

Studies on Technology and Enhancement of Educational Management Practices of Staff Development in secondary schools

Zeph (2022), conducted a descriptive survey in Northern Ireland, United Kingdom to investigate the influence of technology in enhancing staff development on UK High schools. 116 senior staff including principals, vice principals, deans Bursars and form teachers were drawn from 32 high schools and used as sample for the study. Technique used was simple random sampling. Four research questions and four hypotheses guided the study. Instrument used for data collection was a 67-item questionnaire graded on a 4-point scale. Research question were answered with mean and standard deviation while z-test statistics was used for hypotheses testing.

Zeph reported that principals, vice principals, Dean, Bursars and form teachers in Northern Ireland high schools rated the influence of technology in enhancing staff development to a very great extent in their managerial practices. Zeph's study is closely related to this study in so many ways. Foremost, both studies treat the same concept as educational management practices are closely knitted. Also both studies adopted same design and same tools for data analyses. However, Zeph included other management officers of the high schools (Vice principals, Deans, Busars and form teachers) where-as the subjects of this study are only principals. More-so, Zeph was interested in the influence of gender, where-as this study is interested in the influence of school ownership. Summarily, Zeph's study and findings will aid inferences in this study.

Still in Europe, Clerk (2019) investigated the impact of technology on staff training and skill acquisition in high schools in Switzaland. Clerk adopted a descriptive survey design. Six research questions and six hypotheses guided the study. A structured questionnaire consisting 55 items was used for data collection. The questionnaire had a reliability coefficient of 0.62. It was scored on a five point scale. Mean, standard deviation and chi-square were used for data analyses. In the major findings, Clerk reported that the impact of technology on staff training and skill acquisition was very

low in the management of the secondary schools sampled. It was also revealed that public secondary schools staff were impacted more than their private school counterparts. Although Clerk treated the entire concept of educational management, it is still consistent with this study because educational management is an aspect of management. Clerk used chi-square to test hypotheses and focused on skill acquisition, but this study will use z-test statistics to compare public and private schools programs. Hence, Clerk's study is very useful to this study, especially in interpretation of results.

In the North-central state of Kogi, Ukeme (2011) undertook a survey to examine the impact of technology on staff development of secondary school principals' educational management practices. Four research questions and eight hypotheses guided the study. Similarly, four hypotheses addressed influence of academic area of specialization of the Heads of the selected institution. A sample of 26 respondents was drawn by purposive sampling techniques. The sample was made up of 20 secondary school principals, 2 provost of colleges of Education, 2 rectors of polytechnics and 2 vice chancellors of universities. A questionnaire consisting of 30 items was used for data collection. Mean and standard deviation were used to answer the research question. Hypotheses were tested with 2-way ANOVA at 0.05 significance level.

Ukeme's finding shows a low extent on the impact of technology on staff development of secondary school principals' educational management practices. Ukeme's study is consistent with this study in many areas. They both focus on educational management and technology, and the designs are both descriptive survey. However, Ukeme delved into areas such as tertiary education and area of academic specialization of the officers while this study limits itself to secondary education and school ownership. Notwithstanding, Ukeme's work shall aid inferences in this study.

Udoh (2022) studied the enhancement of technology in educational management by heads of Universal Basic Education Institutions in Akwa Ibom state. The study covered primary and Junior secondary schools in Akwa Ibom from where 108 respondents were drawn. The respondents were made up of 62 primary school head teachers and 46 junior secondary school

principals. Three research questions and three hypothesis guided the study. A structured questionnaire made up of 40 items was used for data collection. Research questions were answered using mean while chi-square was used to test the hypotheses. Udoh reported that enhancement of technology in educational management was to a very low extent among the subjects of the study. Also secondary school principals and primary school Head Teachers did not differ in their enhancement of ICT significantly. Though Udoh included primary school Head Teachers, limited the study to junior secondary schools, and tested hypotheses with chi-square, the study is closely related to this present study in many ways. Both studies are concerned with enhancing of technology to educational management. Both studies have secondary school principals as subjects. Both studies are designed alike. Thus, Udoh's findings shall be of immense benefit to this study.

Studies on Technology and Enhancement of Educational Management Practices of Staff welfare in secondary schools

Tiz (2023) conducted a descriptive survey aimed at evaluating the effectiveness of technology in promoting staff welfare in Onterio, Canada. 10 research questions and 15 hypotheses guided the study. An on-line questionnaire made up of 114 items, scored on a 5-point scale was used for data collection. Responses were collected on-line from 150 respondents. Mean, standard deviations were used to answer the research questions while z-test statistics was used to test the hypotheses at 0.05 significant level. Tiz reported that the effectiveness of technology in promoting staff welfare were satisfactory. Also public schools were reported to have more challenges than their counterparts in the private schools. Tiz, treated a lot more variables than this study. Tiz's, study had a wider scope. Yet Tiz study is consistent with this study, as both discussed the same variable (staff welfare practices). A major limitation of Tiz's work was certifying the true identity of the subjects, that is, the respondents. This was because responses were collected on-line and the chances of anybody who is not a head of school responding is high. This limitation is corrected by this

study where data collection shall be done physically, hence, ensuring that only appropriate persons respond to the questionnaire.

Eze (2020) examined the impact of technology on staff welfare of secondary school administrator's educational management practices in Owerri Education zone. Descriptive survey design was adopted for the study. Four research questions and four hypotheses guided the study. A structured, 28-item questionnaire scored on a 4-point scale was used for data collection: mean and standard deviation were used to answer the research questions. z-test was used to test the hypotheses. Eze reported school administrators remained undecided and neutral on how technology would enhance educational management practices in secondary schools. Public school's administrators were reported to have rated it more than their counterparts in the private school's administrators. Eze's work is very consistent with this work both in design and implementation. However, this study shall use a larger sample than Eze who used only 12 public school's administrators and 13 private school's administrators who were drawn via purposive sampling technique.

In Plateau State, Dunga (2021) conducted a descriptive survey aimed at determining the influence of technology on staff welfare by principals of secondary schools in Shendam Local Government Area. Five research questions and five hypotheses guided the study. A structured questionnaire was used for data collection. The questionnaire had 30 items. 35 secondary schools principals were drawn by simple random sampling technique and used as sample for the study. Research questions were answered with mean and standard deviation while hypotheses were tested at 0.05 significant level using the z-test. Major findings of Dunga's study revealed that the influence of technology on staff welfare on principals was rated to a great extent in managing their secondary schools. Dunga covered all aspect of management of secondary school while this study shall limit itself to educational management. However, Dunga's study is very useful to this study as both studies covered aspects of technology and educational management in secondary schools.

In a descriptive survey, Bukola (2020) investigated the extent of technology enhancement in promoting staff welfare practices in secondary schools in Kwara state. Four research questions and four hypotheses guided the study. A structured questionnaire made up of 24 items, scored on a 4-point Likert scale was used for data collection. Questionnaire copies were distributed to respondents directly and collected back same way. A sample of 56 secondary school administrators was drawn by stratified simple random sampling techniques and used for the study. Data collected were analyzed using mean and z-test statistics. Mean was used to answer the research questions while z-test was used to test the hypotheses at 0.05 level of significance.

Bukola reported in his findings that school administrators rated technology not very useful for enhancing staff welfare practices in secondary schools. Also private secondary school administrators and public secondary school administrators did not differ significantly in their ratings. The study is closely related to this present study in many ways. Both studies are concerned with enhancement of technology in educational management. Both studies have secondary school administrators as subjects. Both studies are designed alike. Yet, Bukola's study is very consistent with this study and shall be very useful in drawing rational conclusions.

Studies on Technology and Enhancement of Educational Management Practices of Supervision of instructional procedures in secondary schools

Hung (2024) in a descriptive survey guided by three research questions and three hypotheses sought to determine the extent to which technology enhances supervision of instructional procedures among high school principals in Ohio State of USA. The design used was correlation research design and was guided by four research questions and four hypotheses. The population for the study was 126 high school principals in the province under study, from which a sample of 95 high school principals was drawn using stratified, purposive and simple random sampling techniques. An 18-item structured questionnaire was used for data collection. The

questionnaire was validated and had a reliability coefficient of 0.87. Statistical tools for data analyses in Smith's study were mean with standard deviation (for answering research questions) and spearman's correlation coefficient for hypotheses testing.

Hung found that there existed a positive significance on the extent to which technology enhanced supervision of instructional procedures among high secondary school administrators. With respect to principals' managerial practices, Hung's study was limited to supervision while this present study covers planning, staff training, staff welfare and enforcement of discipline in addition to supervision. Hung answered research questions using mean and standard deviation while spearman's correlation coefficient will be used for hypothesis testing in this study. Notwithstanding these differences, Hung's study will be useful to this present study in many ways; both studies treated same variables.

Amusan (2022) investigated the impact of technology on secondary school principals' supervision practices in Osun State. Description survey design was adopted by the study. Four research questions and four hypotheses guided the study. 820 staff were drawn from 48 public and 36 private secondary schools in Osun State. Simple random sampling technique was used to draw the sample from three strata, namely; principals, teaching staff and non-teaching staff. The sample was made up of 84 principals, 231 non-teaching staff and 505 teaching staff. Data collection was by a 32-item questionnaire. Mean and standard deviation were used to answer the research questions while z-test was employed in hypotheses testing.

Amusan reported the impact of technology on secondary school principals' supervision practices was rated very low. According to Amusan, the public schools' principals were less affected than their private school counterparts. Amusan delved into impact of technology by teaching and non teaching staff in other areas apart from educational management. Hence, the respondents included teachers and no teaching staff. Also all aspects of principals' management functions were covered in Amusan's study. Both studies covered educational management, technology enhancement and secondary school principals as subjects.

Therefore, Amusan's study is very useful for drawing inference in this present one.

Ohanusi (2022) investigated the usefulness of technology in enhancing supervision of instructional procedures practices in educational management by secondary school administrators in Okigwe Education zone of Imo state. Description survey design was adopted. Five research questions and five hypotheses guided the study. A questionnaire made up of 200 items was used for data collection. A sample of 78 secondary school administrators consisting of 48 in urban and 30 in rural schools' was used for the study. Stratified, simple random sampling technique was adopted in drawing the sample. Ohanusi analyzed data with mean and z-test. Major findings of the study revealed that secondary school administrators rated technology very useful for enhancing educational management practices in secondary schools. Use of technology for enhancing supervision of instructional procedures practices in educational management was useful to administrators in urban schools more than their rural counterparts. Ohanusi's work is closely related to this present study. Both studies treated same variables but differed in influence of location and school ownership. Yet, Ohanusi's work is still very useful as it shall guide discussion on findings of this study.

Mkpa (2022) studied the role of technology in improving supervision of instructional procedures by secondary school principals in Abia state. The study covered junior and senior secondary schools in Abia state from where 108 respondents were drawn. The respondents were made up of 46 junior secondary school principals. Three research questions and three hypothesis guided the study. A structured questionnaire made up of 40 items was used for data collection. Research questions were answered using mean while chi-square was used to test the hypotheses. Mkpa reported technology improved supervision of instructional procedures practices by secondary school principals to a low extent. Also secondary school principals did not differ in their influence significantly. Though Mkpa tested hypotheses with chi-square, the study is closely related to this present study in many ways. Both studies are concerned with enhancement of technology in

supervision of instructional procedures. Both studies have secondary school principals as subjects. Both studies are designed alike. Thus, Mkpa's findings shall be of immense benefit to this study.

Studies on Technology and Enhancement of Educational Management Practices of Enforcement of discipline in secondary schools

Dunga (2021) attempted to determine the usefulness of technology in enforcing discipline among students by administrators in secondary schools in Benin City. Descriptive survey was adopted as design of the study. Four research questions and four hypotheses guided the study. A sample of 70 administrators was drawn from all secondary schools in Benin City. The sample consisted of 40 administrators of private schools and 30 from public administrators. Proportionate simple random sampling techniques was used to draw the sample. A 30 item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher using a 4-point likert scale. Mean was used to answer all the research questions. Hypotheses were tested at 0.05 level of significance using chi-square statistics.

Major findings of Dunga's study revealed that secondary school administrators rated technology in enforcing discipline in secondary schools to very great. Public and Private schools principals did not differ significantly in their ratings of educational management. Uji's study and this present work are very closely related. Both studies treated the same variables, adopted same design, used similar subjects and scored their responses same way. However, they differ in data analyses. Uji answered research questions with mean only but this study shall do so with mean and standard deviation. Uji tested hypotheses using chi-square but this study shall use z-test. Notwithstanding, Uji's study shall be very useful in discussing findings of this study, where useful comparison shall be made.

Shehu (2022) investigated the impact of technology on enforcing discipline among secondary school students in Kano state. Shehu adopted a descriptive survey design. Four research questions

and four hypotheses guided the study. A structured questionnaire consisting 25 items was used for data collection. The questionnaire had a reliability coefficient of 0.62. It was scored on a five point scale. Mean, standard deviation and chi-square were used for data analyses. In the major findings, Shehu reported that secondary school administrators rated technology very useful in enforcing discipline among secondary school students. It was also revealed that public secondary schools administrators enforced discipline more than their private school counterparts. Although Shehu treated only one aspect of educational management (enforcement of discipline), it is still consistent with this study. Shehu used chi-square to test hypotheses but this study will use z-test statistics to compare public and private schools programs. Hence, Shehu's study is very useful to this study, especially in interpretation of results.

Lee (2024) attempted to determine the extent to which technology enhances enforcement of discipline practices among principals in Singapore. Descriptive survey was adopted as design of the study. Six research questions and six hypotheses guided the study. Six research questions and 8 hypotheses guided the study. A 15 item checklist was used to collect data on technological skills posed by the principals while a 20-item questionnaire was used to collect data on principals' technological skills in educational management practices. A sample of 50 principals (32 principals and 18 vice principals) was drawn from the already selected 32 schools. Hence, purposive sampling technique was used. Out of the 50, 28 were from public schools and 22 from private schools. Mean and standard deviation were used to answer the research questions while hypotheses were tested with t-test at 0.05 level of significance.

Major findings of Lee's study revealed that technology enhanced enforcement of discipline practices among high school principals to a low extent. Private high schools principals were found to rate it less than their counterparts in the public high schools. King's study and this present work are very closely related. Both studies treated the same variables, adopted same design, used similar subjects and scored their responses same way. However, they differ in data analyses. Lee answered research questions with mean only but this study shall do so with mean and standard

deviation. Lee tested hypotheses using t-test statistics but this study shall use z-test statistics. Notwithstanding, Lee's study shall be very useful in discussing findings of this study, where useful comparison shall be made.

In a descriptive survey, Bashiru (2021) investigated the extent of technology in enforcing disciplinary practices in secondary schools in Lagos state. Four research questions and four hypotheses guided the study. A structured questionnaire made up of 24 items, scored on a 4-point Likert scale was used for data collection. Questionnaire copies were distributed to respondents directly and collected back same way. A sample of 56 secondary school principal was drawn by stratified simple random sampling techniques and used for the study. Data collected were analyzed using mean and z-test statistics. Mean was used to answer the research questions while z-test was used to test the hypotheses at 0.05 level of significance.

Bashiru reported in his findings that school administrators rated technology not very useful in enforcing disciplinary practices in secondary schools. Also public secondary school administrators and private secondary school administrators did not differ significantly in their ratings. The study is closely related to this present study in many ways. Both studies are concerned with enhancement of technology in educational management. Both studies have secondary school administrators as subjects. Both studies are designed alike. Yet, Bashiru's study is very consistent with this study and shall be very useful in drawing rational conclusions.

CHAPTER 27

Topic:

EFFECT OF USE OF CHATBOTS ON ACADEMIC ACHIEVEMENT AND RETENTION OF SECONDARY SCHOOL STUDENTS IN COMPUTER STUDIES IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Studies on Effects of use of Chatbots on Students' Academic Achievement in Public and Private Secondary schools in Urban and Rural locations.

Royal (2018) carried out a study in Central Mexico to determine the effect of Chatbots on high school students' achievement in computer studies. Royal adopted quasi experimental, pretest-posttest design. The study was guided by four research questions and four hypotheses. Purposive, stratified and simple random sampling techniques were used to draw a sample of 323 high school students spread across eight intact classes. Instrument for data collection was a 30-item Computer Achievement Test. The instrument was constructed by the researcher, validated by three research experts and yielded a reliability coefficient of .76. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses. Major findings of the study showed that students taught computer studies with Chatbots achieved higher than their counterparts who were taught the same topics with expository method. Also, rural school's students outperformed their counterparts in urban schools. Royals' study is closely related to this work because they both investigated the effect of computer studies. Both works are closely related.

Jebso (2019) in an experimental study, tried to investigate the effect of use of Chatbots among mathematics students in Mid-West Singapore. Jebso adopted quasi experimental, pretest-posttest

design. Four non-equivalent intact classes were used. Three research questions and five hypotheses guided the study. Jebso reported that students taught with Chatbots training achieved higher than their counterparts who were taught with expository method. Also urban school's students outperformed their counterparts in rural schools. Jebsos' study is closely related to this work because they both investigated the effect of Chatbots, although Jebsos' work focused on mathematics while this work focused on computer studies. Both works are closely related.

Melky (2020) conducted a study on investigating the role of AI Chatbots in shaping academic performance in secondary computer studies in urban and rural schools in central Austrian district. Melky adopted quasi experimental and used four non-equivalent intact classes from both urban and rural schools. Melky's major findings showed that students taught computer studies without chatbots achieved higher than their counterparts who were taught with chatbots. However, rural schools' students achieved higher than urban schools' students. Also, public schools students performed more academically than their private counterparts. Once again, Melky's work focused on academic performance but it is still relevant to this study. This contradiction justified the need for more studies such as this work.

Zest (2021) investigated the effect of use of Chatbots on the interest and achievement of high school students in computer studies. Zest adopted quasi experimental with pretest-posttest control group design. Six intact classes were sampled from two public schools (urban areas) and one private school (rural area) in India. Four research questions and six hypotheses guided the study. A 30-item Computer Achievement Test (CAT) and a 20-item Computer Interest Inventory (CSI) were used for data collection in the study. Scores obtained were analyzed using mean, standard deviation and Analysis of Covariance (ANCOVA). Zest's major findings showed that students taught computer studies using Chatbots and those taught without chatbots showed equal interest and achieved equally. The same result of no significant difference was also obtained on influence of school location and school type. Zest delved into interest in computer studies which is not part of this

present study, notwithstanding, both works are related in design and content.

In another experimental study, Akiri (2021) conducted a study on influence of Chatbots-Assisted learning on academic achievement in computer studies among high school students in Auchi, Edo state. Akiri adopted quasi experimental, pretest-posttest design guided by three research questions and three hypotheses. A sample of 152 students purposively drawn from four intact classes was used in the study. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses. Major findings of the study showed that Chatbots-assisted learning influenced male students' academic achievement in computer studies than their female counterparts. Furthermore, private school's students outperformed their counterparts in public schools. Akiris' study is closely related to this work because they both investigated the effect of Chatbots. Both works are closely related. From the reviews made above, effect of use of Chatbots on students' achievement in computer studies yielded no definitive conclusion.

Ekpe (2022) carried out a study on the effectiveness of Chatbots in boosting academic performance in Ikot Ekpene, Akwa-Ibom. Ekpe adopted quasi experimental, pretest-posttest design. The study was guided by four research questions and six hypotheses. Stratified and simple random sampling techniques were used to draw a sample of 210 secondary school students spread across five intact classes. Data were collected with a 25-item questionnaire. The instrument was constructed by the researcher, validated by three research experts and yielded a reliability coefficient of .69. Mean and standard deviation were used to answer the research questions while z-test statistic was used to test the hypotheses.

Major findings of the study showed that the effectiveness of Chatbots in boosting academic performance was high in private schools than their public schools counterparts. Also, there was no significant difference between male and female students on the effectiveness of Chatbots in boosting academic performance. However, Ekpe tested hypotheses with z-test statistic while this study used Analysis of Covariance for hypotheses testing. Ekpes'

study is consistent with this present study because they both investigated the Chatbots, although Ekpes' work focused only on academic performance, this work covered the academic achievement.

Harry (2022) conducted a study on pedagogical value of Chatbots in secondary school computer studies achievement in Cape Town South Africa. Two research questions and three hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. Sample for the study consisted of 242 senior secondary school two (SS2) students was drawn from 6 intact SS2 classes in 3 secondary schools. The sample consist of (151) female and (91) male students. The sample also was made up of (130) students in the experimental group and (122) students from the control group. Instrument used for data collection was Computer Studies Achievement Test (CSAT). CSAT was made up of 30 items. It was validated by three research experts. CSAT gave a reliability coefficient of .71 obtained using Kudar Richardson 20 Formular.

Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA). Major findings of the study showed that students taught Computer Studies using Chatbots achieved more than their counterparts taught same topics without Chatbots. Urban and rural school students' taught Computer Studies using Chatbots did not differ significantly in their mean achievement scores. It was recommended that use of Chatbots be used in teaching secondary school Computer Studies using Chatbots. Harry's study is very relevant to this study especially.

Ayuba (2022) investigated the effect of Chatbots Instructional aid on students' achievement and interest in Computer Studies in Cape Town. Ayuba adopted a non-equivalent quasi-experimental design. A sample of 292 students was drawn from four single schools in Cape Town. Data collection for the study was done using Computer Studies Achievement Test (COSRAT) and Computer Studies Interest Scale (COMIS). Mean, standard deviation and Analysis of covariance (ANCOVA) were used for data analyses. Result of the study revealed that students achieved higher and showed more interest in Computer Studies when taught

using Chatbots Instructional aid than when taught without Chatbots Instructional aid. Private schools' students achieved higher and showed more interest than their counterparts in public schools. However, Ayuba treated students' interest which is not part of this present study. Also, unlike this study, Ayuba did not treat students' retention and school location. Yet, Ayuba's work was useful in drawing inference in this study.

Studies on Effects of use of Chatbots on Students' Retention in Public and Private Secondary schools in Urban and Rural locations.

Kelvin (2019) in an experimental study, tried to explore Chatbots usage and its effect on students' retention in secondary level computer studies in Southern California United States of America. Kelvin adopted quasi experimental, pretest-posttest design. Two non-equivalent intact classes were used. Two research questions and two hypotheses guided the study. One of the hypotheses sought to determine if there was significant difference between the mean scores on use of Chatbots and its effect on academic retention in secondary level computer studies with regard to their school location while the second hypothesis sought to find out if significant difference existed between the mean retention scores of the students who were exposed to use of Chatbots and their counterparts taught without chatbots. Kelvin reported that students taught using Chatbots retained more than their counterparts who were taught without chatbots. Urban schools' students retained more than rural schools' students in kelvin's study. Kelvin's study is closely related to this work in the sense that they both investigated use of Chatbots. Equally, both works share a closely aligned focus.

Ngoma (2019) conducted a study on effect of use of Chatbots on secondary school students' retention in mathematics in Kenya Central Africa. It was a quasi-experimental study, pretest-posttest, non-equivalent control group design was used. A total of 620 SSII students were drawn from four secondary schools in Agbani Education Zone. Intact classes were randomly assigned experimental and control groups. Mathematics Retention Test was used for data collection. The instrument was validated by three

research experts. Four research Questions and six hypotheses guided the study. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at .05 level of significance using Analysis of Covariance (ANCOVA).

Major findings of the study revealed that students taught mathematics without Chatbots, retained more than their counterparts taught using chatbots. There was no significant difference between the retention scores of urban and rural schools' students taught mathematics with Chatbots. Similarly, there was no significant interaction effect between teaching strategy and school ownership on students' retention in mathematics. Ngoma's work treated the same teaching strategy but different subject area from the one used in this study. Ngoma focused on retention while this study focused on academic achievement. More so, both studies were conducted in Enugu state.

Nwankwo (2021) conducted a study on the role of Chatbots in enhancing academic retention in computer studies for secondary school students in Enugu state. It was a quasi-experimental study, pretest-posttest, non-equivalent control group design was used. A total of 140 JSSII students were drawn from two secondary schools in Enugu Education Zone. Intact classes were randomly assigned experimental and control groups. The instrument was validated by three research experts and achieved a reliability of .71. Two research Questions and three hypotheses guided the study. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at .05 level of significance using Analysis of Covariance (ANCOVA).

Major findings of the study revealed that students taught computer studies using Chatbots, retained more than their counterparts taught without chatbots. Also female students retained more than their male counterparts. There was no significant difference between the retention scores of private and public school students taught computer studies using Chatbots. Similarly, there was no significant interaction effect between teaching strategy and school ownership on students' retention in computer studies. Nwankwo's work treated the same teaching strategy but different subject area from those used in this study. However, Nwankwo's

study is very relevant to this study especially as the study was conducted in the same area with this present study (Enugu state).

Adejumo (2022) in a study titled effect of Chatbots Instructional aid on secondary school student's retention in Shagamu, Ogun state adopted a quasi-experimental study. Pretest-posttest, non-equivalent control group design was used. A total of 692 students were drawn from intact classes in the six secondary schools in Shagamu Ogun state. Intact classes were randomly assigned experimental and control groups. Six research questions and six hypotheses guided the study. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at .05 level of significance using z-test. Major findings of the study revealed that students taught with Chatbots Instructional aid retained more than their counterparts taught without chatbots. Public schools' students retained more than their counterparts in Private schools.

Studies on Effects of use of Chatbots on Students' Academic Achievement and Retention in Public and Private Secondary schools in Urban and Rural locations.

Kofi (2019) attempted to determine the effect of use of Chatbots on students' academic achievement and retention in computer studies in public and private colleges in Katima, Namibia. Kofi adopted quasi experimental design for the study. Three research questions and five hypotheses guided the study. Using purposive and simple random sampling techniques, Kofi drew 10 intact classes from 85 colleges. Hence, a total of 396 students as sample for the study. Computer Multiple Choice Test (COMCT) was used to collect data for the study. The 35-item COMCT was constructed by the researcher and validated by 5 experts. It yielded a reliability coefficient of .88 via KR-20 formula. Mean and standard deviation were used to answer the research questions while hypotheses were tested using ANCOVA at .05 level of significance. Kofi reported that students taught using Chatbots achieved higher and retained more than their counterparts who were taught without chatbots. Public school's students achieved higher and retained more than their counterparts in private schools. Kofi's study is

closely related to this work because they both treated students' academic achievement, students' retention, effects of chatbots and school type. Both studies also adopted same design. However, Kofi was interested in school type alone while school location was added in this study. Yet, Kofi's work aided inference in this study.

Kim (2021) in an experimental study, investigated the effect of use of Chatbots on students' academic achievement and retention in high schools in Ohio, USA. Kim adopted quasi experimental, pretest-posttest design. Four research questions and six hypotheses guided the study. Kim drew a sample of 720 high school students from a population of 82,936 using purposive and simple random sampling techniques. Computer studies aptitude test was used for data collection. Research questions were answered using mean and standard deviation while hypotheses were tested using ANCOVA at .05 level of significance. Kim reported that students taught using Chatbots achieved higher and retained more than their counterparts who were taught without chatbots. Also private school's students outperformed their counterparts in public schools in both academic achievement and retention. Kim's study is closely related to this work because they both investigated the effect of Chatbots, although Kim's work focused only on school type while this study treated both school type and school location. Notwithstanding, Kim's work served well in discussion of findings of this work.

Ojim (2021) attempted to determine the effect of use of Chatbots on students' academic achievement and retention in computer studies in Obudu local government Area of Cross River state. Ojim adopted quasi experimental design for the study. Two research questions and three hypotheses guided the study. Using purposive and simple random sampling techniques, Ojim drew 8 intact classes from 4 (two public and two private) secondry schools in the area of study. Thus, a total of 235 students as sample for the study. Computer Achievement Test (CAT) was used to collect data for the study. The 30-item CAT was constructed by the researcher and validated by 3 experts. It yielded a reliability coefficient of .91 using KR-20 formula. Mean and standard deviation were used to answer the research questions while hypotheses were tested using ANCOVA at .05 level of significance. Ojim reported that students

taught using Chatbots achieved higher and retained more than their counterparts who were taught without chatbots. Public school's students achieved higher and retained more than their counterparts in private schools. Ojim's study is closely related to this work because they both treated students' academic achievement, students' retention, effects of chatbots and school type. Both studies also adopted same design. However, Ojim was interested in school type alone while school location was added in this study. Despite this, Ojim's work aided inference in this study.

Larry (2023) explored the effect of Chatbots-Assisted learning on students' academic achievement and retention in sciences. It was non-equivalent quasi experimental pretest posttest control group design conducted in Lagos state Nigeria. Intact classes were randomly drawn and assigned to experimental and control groups. Four research questions and four hypotheses guided the study. Science Achievement Test (SAT) was used to collect achievement scores respectively. SAT was reshuffled and used to collect retention scores after two weeks of posttest. Mean of all scores were obtained while hypotheses testing was done using ANCOVA at .05 significant level. Larry reported in major findings that the students achieved and retained equally in both experimental and control groups. The students achieved and retained equally irrespective of their school location and school type. Hence, another case of no significant difference. Larry's study and this present work are related in design and content.

Uyi (2023) in an experimental study, investigated the effect of use of Chatbots on students' academic achievement and retention in public and private schools in Auchi, Edo State. Uyi adopted quasi experimental, pretest-posttest design. Three research questions and five hypotheses guided the study. Uyi drew a sample of 319 high school students from a population of 14,282 using purposive and simple random sampling techniques. Computer Studies Achievement Test (CSAT) was used for data collection. CSAT had 40 multiple choice question. Research questions were answered using mean and standard deviation while hypotheses were tested using ANCOVA at .05 level of significance. Uyi reported that students taught using Chatbots achieved higher and retained more

than their counterparts who were taught without chatbots. Also private school's students outperformed their counterparts in public schools in both academic achievement and retention. Uyi's study is closely related to this work because they both investigated the effect of Chatbots on students' academic achievement and retention in computer studies. Although Uyi's work focused only on school type while this study treated both school type and school location. Nevertheless, Uyi's work was useful in making comparisons during discussion of findings in this study.

CHAPTER 28

Topic:

PRINCIPALS' MANAGERIAL PRACTICES AS DETERMINANT OF TEACHER PRODUCTIVITY IN SECONDARY SCHOOLS IN ENUGU STATE, NIGERIA

Here are reviews of some empirical works related to this topic

Studies on Principals' Managerial Practices relating to Internal Supervision

Smith (2020) conducted a study to determine the relationship between high school principals' internal supervision practices and teacher productivity in Ohio State of USA. The design used was correlation research design and was guided by four research questions and four hypotheses. The population for the study was 126 high school principals in the province under study, from which a sample of 95 high school principals was drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection were Principals' Internal Supervision Inventory (PISIN) and Teacher Productivity Scale (TEPS). They were constructed by the researcher and validated by three research experts. Principal' Internal Supervision Inventory yielded a reliability coefficient of .78 while Teacher Productivity Scale yielded a reliability coefficient of .76 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Smith's study were mean with standard deviation (for answering research questions) and spearman's correlation coefficient for hypotheses testing.

Smith found that a strong positive correlation existed between high school principals' internal supervision practices and teacher productivity in Ohio State of USA. The relationship was same for male and female high school principals as well as principals in high schools located in urban and rural areas. With

respect to principals' managerial practices, Smith's study was limited to internal supervision while this present study covers performance appraisal, staff training, staff welfare and enforcement of discipline in addition to internal supervision. Smith answered research questions using mean and standard deviation while Pearson's product moment correlation coefficients will be used to answer research questions in this study. Smith tested hypothesis with spearman's correlation coefficient while regression analyses will be used for hypothesis testing in this study. Notwithstanding these differences, Smith's study will be useful to this present study in many ways; both studies treated same variables such as internal supervision, teacher productivity and principals' gender. Both studies adopted similar research design and instrumentation. Consequently, Smith's study cannot be neglected in a study such as this present one.

Obome (2018) conducted a study titled secondary school principals' internal supervision: predictor of teacher productivity in Afikpo Education zone of Ebonyi state. Correlation research design was adopted in the study. Three research questions and three hypotheses guided the study. Sample for the study was 45 secondary school principals in Afikpo Education zone of Ebonyi state. Two instruments were used for data collection in the study. One was principals' Internal Supervision Questionnaire (PISUQ) and the other was Teacher Productivity Inventory (TEPIN). The instruments were constructed by the researcher and validated by five research experts. Pearson Product Moment Correlation Coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analyses. In the major findings, Obome reported that principals' internal supervision had a strong positive correlation with teacher productivity in Afikpo Education zone of Ebonyi state. The relationship was stronger with female secondary school principals than with their male counterparts. Obome treated only internal supervision, teacher productivity and principals' gender while this study treats internal supervision, performance appraisal, staff training, staff welfare, enforcement of discipline, teacher productivity, and principals' gender. On the other hand, Obome adopted similar research design with that of this study. Also,

Obome's study is consistent with this study in choice of statistical tools for data analysis. Most importantly, all the variables in Obome's study constitute major components of this present study. Hence, both studies are related.

Ademola (2017) conducted a cross sectional study of internal supervision impact on teacher productivity in secondary schools in Akure, Ondo state. Design of the study was Ex-Post Facto. Five research questions and five hypotheses guided the study. Sample for the study was 60 secondary school principals in Akure, Ondo state drawn through proportionate and simple random sampling techniques. Ademola collected data with a structured questionnaire and used mean with standard deviation to answer research questions and t-test for testing hypotheses. Major findings of Ademola's study revealed that internal supervision had a strong positive impact on teacher productivity in the sampled schools. The impact was stronger with male principals than with their female counterparts. Ademola's study differed from this present work in choice of research design, statistical tools for data analyses, instrumentation and scope. For instance, Ademola was interested in internal supervision, teacher productivity and principals' gender as variables. Whereas, variables of this present study include internal supervision, performance appraisal, staff training, staff welfare, enforcement of discipline, teacher productivity and principals' gender. Notwithstanding, Ademola's work is related to this study since internal supervision, teacher productivity and principals' gender were variables in this study and Ademola's. As a result, Ademola's work will aid inferences in this study.

Harry (2017) investigated the relationship between internal supervision and teacher productivity in High schools in Colorado, USA. Correlation research design was adopted in the study. Three research questions and two hypotheses guided the study. Sample for the study was 185 High school principals drawn from a population of 290 high school principals in Colorado. The sampling was done using cluster and simple random sampling techniques. Two instruments were used for data collection namely Questionnaire on principals' internal supervision (QUPIS) and Teacher Productivity Inventory (TPI). The instruments were constructed by the researcher

and validated by three research experts. Mean and standard deviation were used to answer research questions while Spearman correlation coefficient was used to test hypothesis. Harry reported a weak correlation between High school principals' internal supervision and teacher productivity among the sample drawn for the study. The relationship was same for male and female high school principals in the area Harry studied. Harry's study and this present work relate in content such as internal supervision, teacher productivity and principals' gender. However, this study is wider in scope than Harry's study as it also covers internal supervision, performance appraisal, staff training, staff welfare and enforcement of discipline. Also, both studies differed in choice of statistical tools for data analysis. Thus, Harry's study will be useful in discussion of findings of this present study where veritable comparisons will be made.

Mbang (2019) conducted a study on predictive tendencies between internal supervision and teacher productivity in secondary schools in Calabar, Cross River state. It was a causal comparative study guided by four research questions and four hypothesis. Using proportionate and simple random sampling techniques, Mbang drew a sample of 65 secondary school principals in Calabar. Internal Supervision Scale (ISS) and Teacher Productivity Questionnaire (TPQ) were used for data collection. Simple percentage was used to answer the research questions while t-test statistic was used to test hypothesis at 0.05 significant level. Mbang found a strong predictive tendency between principals' internal supervision and teacher productivity in Calabar, Cross River state. The relationship was stronger among female secondary school principals than their male counterpart in the study. Mbang's study differed from this work in design, data analysis and scope. Mbang handled only internal supervision, teacher productivity and principals' gender as variables. Although, variables of this present study include internal supervision, performance appraisal, staff training, staff welfare, enforcement of discipline, teacher productivity, and principals' gender. Hence, Mbang's work is closely related to this study meanwhile internal supervision, teacher productivity and principals'

gender were variables in this study and Mbang's. Thus, Mbang's study will be relevant to this present work.

Jinadu (2017) examined the correlation between internal supervision and teacher productivity in Secondary School in Bauchi state. Correlation research design was adopted in the study. Jinadu formulated four research questions and three hypotheses. Instruments for data collection were a 23-item Internal Supervision Questionnaire (ISQ) and a 19-item Teacher Productivity Scale (TPS). Both instrument were constructed by the researcher and validated by research experts. ISQ yielded a reliability of .81 while TPS yielded a reliability of .79. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses. In the major findings, Jinadu found that principals' internal supervision had a strong positive correlation with teacher productivity in the study. The relationship was stronger with male secondary school principals than their female counterparts. Jinadu's study covered internal supervision, teacher productivity and principals' gender while this study covers internal supervision, performance appraisal, staff training, staff welfare, enforcement of discipline, teacher productivity and principals' gender. Hence, this study is wider in scope than Jinadu's. Despite this difference, Jinadu's study and this present work are closely related in many ways. Foremost, Jinadu adopted similar research design with that of this study. Also, Jinadu's study is consistent with this study in choice of statistical tools for testing hypotheses. Most importantly, the major variables in Jinadu's work were also part of this present study. Hence, Jinadu's work will be useful to this study especially in discussion of findings.

Studies on Principals' Managerial Practices relating to Performance Appraisal

McDonald (2020) attempted to determine the influence of Performance Appraisal on teacher productivity in High schools in Kentucky, USA. It was a descriptive survey guided by four research questions and four hypotheses. A total of 430 high school principals served as sample for the study. The sample was made of 185 males

and 245 females. A structured questionnaire was used for data collection. The questionnaire was made up of 28-items scored on a four point scale. The researcher constructed the questionnaire and subjected it to validation by three experts. Mean with standard deviation was used to answer the research questions while the hypotheses were tested at 0.05 level of significance using Analyses of Variance (ANOVA).

Major findings of the study revealed that Performance Appraisal influenced teacher productivity in High school to a very great extent. The influence was more significant among male High school principals than their female counterparts. McDonald's study is related to this work because both studies considered performance appraisal, teacher productivity and principals' gender as variables. However, McDonald's study differed from this study in design, instrumentation and data analyses. Also they differed in scope where McDonald studied only performance appraisal, teacher productivity and principals' gender whereas this study extended its coverage to performance appraisal, internal supervision, staff training, staff welfare, enforcement of discipline, teacher productivity and principals' gender. Yet, McDonald's study will aid inferences and comparisons in this study.

Alaje (2017) conducted a study on relationship between performance appraisal and teacher productivity in secondary schools in Ibadan metropolis, Oyo state. The design used was correlation design and was guided by four research questions and four hypotheses. The population for the study was 382 secondary school principals in Ibadan metropolis. Out of this population, Alaje sampled 191 secondary school principals representing 50% of the population. Simple random sampling technique was used to draw the sample from two clusters (well-educated and less educated secondary school principals). Instruments for data collection were Performance Appraisal Inventory (PAI) and Teacher Productivity Questionnaire (TPQ). Performance Appraisal Inventory was made up of 20 items while Teacher Productivity Questionnaire consisted of 28 items. Both instruments were constructed by the researcher and validated by research experts. Pearson product moment

correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analyses.

In the major findings, Alaje reported that performance appraisal had a strong positive correlation with teacher productivity in Ibadan metropolis, Oyo state. The relationship was same for well-experienced and less experienced secondary school principals. Alaje's study was limited to performance appraisal, teacher productivity and principals' gender while this study extended its coverage to performance appraisal, internal supervision, staff training, staff welfare, enforcement of discipline, teacher productivity, and principals' gender. Alaje was interested in the educational level of secondary school principals while this study is interested in performance appraisal, teacher productivity and principals' gender. On the other hand, Alaje adopted similar research design and instrumentation with that of this study. Also, Alaje's study is consistent in this study in choice of statistical tools for answering research questions and testing hypotheses. In the same vein, major variables in Alaje's study (performance appraisal, teacher productivity and principals' gender) constitute major components of this present study. Hence, Alaje's work will be found useful to this work.

Ngugah (2017) investigated the relationship between performance appraisal and teacher productivity in secondary schools in Nairobi, Kenya. Correlation research design was adopted in the study. Five research questions and two hypotheses guided the study. Sample for the study was 780 secondary school principals drawn from a population of 1,059 secondary school principals in Nairobi, Kenya during the study. The sampling was done using cluster and simple random sampling techniques. Two questionnaires were used for data collection, one on performance appraisal and another on teacher productivity. The instruments were constructed by the research and validated by five research experts. Research questions were answered using simple percentage while hypotheses were tested at .05 significant level using Analysis of Variance (ANOVA). In the major findings, Ngugah reported a strong correlation between the key variables (performance appraisal and teacher productivity). The relationship was same for male and

female secondary school principals in the study. Ngugah's study and this present work relate in content, instrumentation and design. On the other hand, this study was wider in scope than Ngugah's study. Also, both studies differed in choice of statistical tools for data analysis. Nevertheless, Ngugah's study will be useful in discussion of findings in this present study.

Marshal (2020) conducted a study to establish the relationship between performance appraisal and teacher productivity in High schools in East London, UK. The design used was correlation survey design and was guided by three research questions and two hypotheses. A sample of 79 high school principals was drawn for the study using stratified, purposive and simple random sampling techniques. Instruments for data collection were Performance Appraisal Scale (PAS) and Teacher Productivity Questionnaire (TPQ). They were constructed by the researcher and validated by three research experts. PAS yielded a reliability coefficient of .79 while TPQ gave a reliability of .81 all obtained through Cronbach's Alpha method. Statistical tools for data analyses were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Marshal found that principals' performance appraisal had a very weak correlation with teacher productivity in East London, UK. The correlation was same for male and female high school principals. Marshal's study is related to this work in design, content and instrumentation. Both studies considered performance appraisal, teacher productivity and principals' gender as main variables. However, Marshal's study differed from this study in data analyses and scope. Notwithstanding, Marshal's study will aid useful comparisons in this study.

Marua (2018) investigated the extent to which performance appraisal could predict teacher productivity in Secondary schools in Gombe state. Correlation research design was adopted in the study. Four research questions and four hypotheses guided the study. Sample for the study was 68 secondary school principals in Gombe state. Data collection was done with Performance Appraisal Identifier (PAID) and Teacher Productivity Questionnaire (TPQ). PAID had 33 items while TPQ had 25 items. Both instruments

proved to be reliable in Cronbach's alpha analyses where PAID yielded a reliability coefficient of .88 and TPQ yielded a reliability coefficient of .92. Pearson product moment correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analysis.

In the major findings, Marua reported that principals' performance appraisal had a strong positive correlation with Teacher productivity in the study. The relationship was stronger among secondary school principals in rural areas than their counterparts in the urban areas. Variables in Marua's study included performance appraisal, teacher productivity and school location of secondary school principals while this study covered performance appraisal, internal supervision, staff training, staff welfare, enforcement of discipline, teacher productivity and principals' gender. Marua was interested in secondary schools principals' location while this researcher was interested in principals' gender. On the other hand, Marua adopted similar research design and instrumentation with those of this study. Both studies also adopted same statistical tools for data analyses. Hence, both studies are closely related.

Adung (2018) examined role of performance appraisal on teacher productivity in secondary schools in Ikom Local Government Area of Cross-River state. Descriptive research design was adopted in the study. Three research questions and three hypotheses guided the study. Sample for the study was 113 secondary school principals drawn using simple random sampling technique. A questionnaire made up of 30 item was used for data collection in the study. The instrument was constructed by the researcher and validated by three research experts. Mean with standard deviation was used to answer the research questions while hypotheses were tested using z-test statistics.

In the major findings, Adung reported that principals' performance appraisal could cause teacher productivity in Ikom Local Government Area of Cross-River state. Female secondary school principals rated higher in favor of this finding than their male counterparts. Adung treated only performance appraisal, teacher productivity and principals' gender while this study treats

performance appraisal, internal supervision, staff training, staff welfare, enforcement of discipline, teacher productivity and principals' gender. Adung also differed from this study in choice of design, instrumentation and tools for data analyses. Not minding, Adung's work was very useful to this study since Adung's major variables (Performance appraisal, teacher productivity and gender) form major components of this study.

Studies on Principals' Managerial Practices relating to Staff Training

Preesha (2019) investigated the influence of staff training on teacher productivity among high schools in Delhi, India. It was a descriptive survey guided by four research questions and four hypotheses. Preesha drew a sample of 88 (31 males and 57 females) high schools principals using proportionate and simple random sampling techniques. A structured questionnaire made up of 35-items was used for data collection. Mean statistic was used to answer the research questions while t-test statistic was used to test hypothesis at 0.05 significant level. Preesha found a strong influence of High school principals' staff training on teacher productivity among the sample. The relationship was stronger among younger high school principals than their older counterpart in the study. Preesha's study differed from this work in design, data analysis and scope. Also, Preesha was interested in comparison of older and younger high school principals instead of principals' gender (male/female) considered in this study. Both studies relate closely since staff training and teacher productivity were core variables in both studies. Thus, Preesha's study is relevant to this present work.

Okoro (2018) conducted a study on influence of staff training and teacher productivity in secondary schools in Owerri, Imo state. Design of the study was Causal comparative. Three research questions and three hypotheses guided the study. Sample of the study was 53 identified secondary school principals in Owerri, Imo state drawn through proportionate and simple random sampling techniques. Okoro collected data with a structured questionnaire and used simple percentage to answer research questions and z-test statistic for testing hypothesis. Major findings of Okoro's study

revealed that staff training had a strong influence on teacher productivity in Owerri, Imo state. The relationship was stronger with female secondary school principals than their male counterparts. Okoro's study differed from this present work in choice of research design, statistical tools for data analyses, instrumentation and scope. Notwithstanding, Okoro's work relates with this study since staff training, teacher productivity and principals' gender were variables treated in this study and Okoro's. Consequently, Okoro's work will aid inferences in this study.

Yandev (2020) conducted a study to determine the relationship between staff training in secondary schools in Gboko, Benue state. Yandev adopted correlation research design guided by two research questions and two hypotheses. The population for the study was 64 secondary school principals in Gboko, Benue state. Yandev used the entire population as sample for the study. Instruments for data collection were Staff Training Inventory (STIN) and Teacher Productivity Questionnaire (TEPQ). They were constructed by the researcher and validated by three research experts. STIN yielded a reliability coefficient of .83 while TEPQ yielded a reliability coefficient of .85 obtained through Cronbach's Alpha method. Yandev analyzed data using mean with standard deviation (for answering research questions) and spearman's correlation coefficient for hypotheses testing.

In the major findings, Yandev reported that a strong positive correlation existed between principals' staff training and teacher productivity in Gboko, Benue state. The relationship was same for male and female secondary school principals. Yandev's study was limited to staff training, teacher productivity and principals' gender while this study extended its coverage to staff training, performance appraisal, internal supervision, staff welfare, enforcement of discipline, teacher productivity and principals' gender. Yandev answered research questions using mean and standard deviation while Pearson's product moment correlation coefficient was used to answer research questions in this study. Yandev tested hypotheses with spearman's correlation coefficients while regression analyses was used for hypothesis testing in this study. Notwithstanding these differences, Yandev's study was useful to this present study in many

ways because both studies treated same variables such as Staff training, teacher productivity and principals' gender. Both studies adopted similar research design, and instrumentation. Consequently, Yandev's study cannot be neglected in a study such as this present one.

Davidson (2020) examined the correlation between staff training and teacher productivity in high schools in New York City, USA. Correlation research design was adopted in the study. Davidson formulated three research questions and three hypotheses. Instruments for data collection were Staff Training Identifier (STID) and Teacher Productivity Scale (TEPS). Both instrument were constructed by the researcher and validated by research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Davidson found a strong positive correlation between principals' staff training and teacher productivity in New York City, USA. The relationship was stronger with male high school principals than their female counterparts. Davidson's study covered staff training, performance appraisal, internal supervision, staff welfare, enforcement of discipline, teacher productivity, principals' gender and school location. Hence, this study is wider in scope than Davidson's. Despite this difference, Davidson's study and this present work are closely related in many ways. Foremost, Davidson adopted similar research design with that of this study. Also, Davidson's study is consistent with this study in choice of statistical tools for testing hypotheses. Most importantly, the major variables in Davidson's work were also part of this present study.

Baro (2018) investigated the extent to which staff training could predict teacher productivity in secondary schools in Yenogoa, Bayelsa state. Correlation research design was adopted in the study. Three research questions and three hypotheses guided the study. Sample for the study was 48 secondary school principals in Yenogoa, Bayelsa state. Two questionnaires were used for data collection in the study. One was Staff Training Questionnaire (STQ) and the other was Teacher Productivity Questionnaire. The

questionnaires were constructed by the research and validated by research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Baro reported that principals' staff training had a strong positive correlation with teacher productivity in Yenogoa, Bayelsa state. The relationship was stronger with less experienced secondary school principals than their more experienced counterparts. Baro's variables included staff training, teacher productivity and principals' gender while this study covers staff training, performance appraisal, internal supervision, staff welfare, enforcement of discipline, teacher productivity and principals' gender. On the other hand, Baro adopted similar research design with that of this study. Also, Baro's study is consistent with this study in choice of statistical tools for data analysis. Hence, both studies are related.

Abdullahi (2017) studied staff training as a predictor of teacher productivity in secondary schools in Lafia, Nasarawa state. Abdulahi adopted Correlation research design for the study. Four research questions and four hypotheses guided the study. Sample for the study was 67 secondary school principals drawn from a population of 113 secondary school principals in Lafia, Nasarawa state. The sampling was done using proportionate and simple random sampling techniques. The sample consisted of 39 females and 28 males. Staff Training Scale (STS) and Teacher Productivity Scale (TPSC) were used for data collection in the study. The instruments were constructed by the research and validated by three research experts. Mean and standard deviation were used to answer research questions while Spearman correlation coefficient was used to test hypothesis.

Abdullahi found a strong positive correlation between principals' staff training and teacher productivity for the study. The relationship was same for male and female secondary school principal sampled in the study. Abdulahi's study and this present work relate in content, instrumentation and design. However, this study is wider in scope than Abdulahi's study. Also, both studies differed in choice of statistical tools for data analysis.

Notwithstanding, Abdulahi's study will be useful in discussion of findings of this present study where comparisons were made.

Studies on Principals' Managerial Practices relating to Staff Welfare

Jackson (2020) examined the extent to which staff welfare could elicit teacher productivity in High schools in Toronto, Canada. Correlation research design was adopted in the study. Four research questions and four hypotheses guided the study. Sample for the study was 48 high school principals in Toronto, Canada. Data collection was done with Staff Welfare Inventory (SWIN) and Teacher Productivity Questionnaire (TEPQ). SWIN had 23 items while TEPQ had 28 items. The instruments SWIN and TEPQ yielded reliability coefficients of .88 and .75 respectively. Pearson product moment correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analysis.

In the major findings, Jackson reported that principals' Staff welfare had a strong positive correlation with teacher productivity in Toronto, Canada. The relationship was stronger among High school principals' than their counterparts. Jackson studied Staff training, teacher productivity and principals' gender as variables while this study was concerned with staff welfare, staff training, performance appraisal, internal supervision, enforcement of discipline, teacher productivity and principals' gender. Interestingly, Jackson adopted similar research design and instrumentation with those of this study. Both studies also adopted same statistical tools for data analyses. Thus, Jackson's study was considered very relevant to this work.

Taswir (2019) conducted a study on relationship between staff welfare and teacher productivity in secondary schools in Katiba District of Namibia. The design used was correlation design and was guided by four research questions and four hypotheses. The population for the study was 228 secondary school principals in Katiba District. From this population, Taswir sampled 114 secondary school principals using simple random sampling technique. Instruments for data collection were Staff Welfare

Inventory (SWEIN) and Teacher Productivity Questionnaire (TPQ). Staff Welfare Inventory was made up of 20 items while Teacher Productivity Questionnaire consisted of 25 items. Both instruments were constructed by the researcher and validated by research expert. Pearson product moment correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analyses.

Major findings of the study reported that principals' Staff welfare had a strong positive correlation with teacher productivity in the area. The relationship was same for urban and rural secondary school principals. Taswir's study was limited to Staff training, teacher productivity, principals' gender and school location while this study extended its coverage to staff welfare, staff training, performance appraisal, internal supervision, enforcement of discipline, teacher productivity and principals' gender. Taswir was interested in school location while this study is interested in principals' gender. Conversely, Taswir adopted similar research design and instrumentation with that of this study. Also, Taswir's study is consistent in this study in choice of statistical tools for answering research questions and testing hypotheses. Additionally, major variables in Taswir's study (staff welfare, teacher productivity, principals' gender and school location) constitute major components of this present study. Hence, Taswir's work is very useful to this present work.

Ogbonna (2017) conducted a study to find out the relationship between Staff welfare and teacher productivity in secondary schools in Abia state. The design used was correlation survey design and was guided by three research questions and two hypotheses. A sample of 79 secondary school principals was drawn for the study using stratified, purposive and simple random sampling techniques. Instruments for data collection were Staff Welfare Scale (SWS) and Teacher Productivity Questionnaire (TPQ). They were constructed by the researcher and validated by three research experts. SWS yielded a reliability coefficient of .79 while TPQ gave a reliability of .81 all obtained through Cronbach's Alpha method. Statistical tools for data analyses were simple percentage (for

answering research questions) and Analysis of Variance (ANOVA) for hypotheses testing.

Ogbonna found that principals' Staff welfare and Teacher productivity had a very weak correlation in Abia state. The correlation was same for male and female Secondary school principals. Ogbonna's study is related to this work in design, content and instrumentation. Both studies considered staff welfare, teacher productivity and principals' gender as main variables. However, Ogbonna's study differed from this study in data analyses and scope. Notwithstanding, Ogbonna's study will aid useful comparisons in this study.

Kelly (2020) studied the influence of Staff welfare and teacher productivity in High schools in Dundee, Scotland. It was a descriptive survey guided by four research questions and four hypotheses. A total of 430 high school principals served as sample for the study. The sample was made of 185 males and 245 females. A structured questionnaire was used for data collection. The questionnaire was made up of 28-items scored on a four point scale. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at 0.05 level of significance using Analyses of Variance (ANOVA).

Major findings of the study revealed that principals' Staff welfare influenced teacher productivity to a very great extent. The influence was more significant among female high school principals than their male counterparts. Kelly's study is related to this work because both studies considered Staff welfare, teacher productivity and principals' gender as main variables. However, Kelly's study differed from this study in design, instrumentation and data analyses. Also they differed in scope where Kelly studied only staff welfare, teacher productivity and principals' gender whereas this study extended its coverage to staff welfare, staff training, performance appraisal, internal supervision, enforcement of discipline, teacher productivity and principals' gender. Yet, Kelly's study will aid inferences and comparisons in this study.

Nathir (2019) examined correlation between staff welfare and teacher productivity in High schools in Northern India. Descriptive research design was adopted for the study. Three

research questions and three hypotheses guided the study. Sample for the study was 123 high school principals drawn using simple random sampling technique. A questionnaire made up of 30 item was used for data collection in the study. The instrument was constructed by the research and validated by three research experts. Mean with standard deviation was used to answer the research questions while hypotheses were tested using z-test statistics.

In the major findings, Nathir reported significant correlation between principals' staff welfare and teacher productivity among the sample drawn for the study. Male high school principals rated higher in favor of this finding than their female counterparts. Nathir treated only staff welfare, teacher productivity and principals' gender while this study treated staff welfare, staff training, performance appraisal, internal supervision, enforcement of discipline, teacher productivity and principals' gender. Nathir also differed from this study in choice of design, instrumentation and tools for data analyses. Not minding, Nathir's work was very useful to this study since Nathir's major variables (staff welfare, teacher productivity and principals' gender) formed major components of this present study.

Kadiri (2017) investigated the relationship between staff welfare and teacher productivity in secondary schools in Warri, Delta state. Correlation research design was adopted in the study. Five research questions and two hypotheses guided the study. Sample for the study was 680 secondary school principals drawn from a population of 1,290 secondary school principals in Warri, Delta state during the study. The sampling was done using cluster and simple random sampling techniques. Two questionnaires were used for data collection, one on Staff Welfare and the other on Teacher Productivity. The instruments were constructed by the research and validated by three research experts. Research questions were answered using mean with standard deviation while hypotheses were tested at .05 significant level using z-test statistics.

Major findings of the study revealed a strong correlation among the key variables (staff welfare, teacher productivity and principals' gender). The relationship was same for male and female secondary school principals in the study. Kadiri's study and this

present work relate in content, instrumentation and design. Contrarily, this study is wider in scope than Kadiri's study. Both studies differed in choice of statistical tools for data analysis. Nevertheless, Kadiri's study will be useful in discussion of findings in this present study.

Studies on Principals' Managerial Practices relating to Enforcement of Discipline

Hilton (2020) investigated the relationship between Enforcement of discipline and teacher productivity in High schools in Cape Town, South Africa. Correlation research design was adopted in the study. Two research questions and two hypotheses guided the study. Sample for the study was 205 high school principals drawn from a population of 555 high school principals in Cape Town. Two instruments were used for data collection, one was Enforcement of Discipline Scale (EDS) and the other was Questionnaire on Teacher Productivity (QUTP). Hilton constructed the instruments and subjected them to validation by three research experts. Mean statistic was used to answer research questions while Spearman correlation coefficient was used to test hypothesis.

In the major findings, Hilton reported no significant correlation between principals' Enforcement of discipline and teacher productivity among the sample drawn for the study. The relationship was same for male and female high school principals in the area Hilton studied. Hilton's study and this present work relate in content instrumentation and design. However, this study is wider in scope than Hilton's study. Also, both studies differed in choice of statistical tools for data analysis. Nevertheless, Hilton's study will be useful in discussion of findings of this present study where veritable comparisons were made.

Adikpe (2017) examined the correlation between Enforcement of discipline and teacher productivity in secondary schools in Auchi, Edo State. Correlation research design was adopted in the study. Adikpe formulated three research questions and three hypotheses. Instruments for data collection were an 18-item Questionnaire on Enforcement of Discipline (QUED) and a 20-item Inventory on Teacher Productivity (INTEP). Both instrument

were constructed by the researcher and validated by research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

Adikpe found that principals' Enforcement of discipline caused teacher productivity in the study. Hence, a strong positive relationship. The relationship was stronger with female secondary school principals than with their male counterparts. Adikpe's study covered Enforcement of discipline, teacher productivity and principals' gender while this study covers Enforcement of discipline, staff welfare, staff training, performance appraisal, internal supervision, teacher productivity and principals' gender. Hence, this study is wider in scope than Adikpe's. Despite this difference, Adikpe's study and this present work are closely related in many ways. In the first place, Adikpe adopted similar research design with that of this study. Also, Adikpe's study is consistent with this study in choice of statistical tools for testing hypotheses. Most importantly, the major variables in Adikpe's work were also part of this present study.

Adoga (2020) conducted a study to determine the relationship between enforcement of discipline and teacher productivity in secondary schools in Federal Capital Territory, Abuja. The design used was correlation research design and was guided by three research questions and three hypotheses. Adoga drew a sample of 148 (51 males and 97 females) using proportionate and simple random sampling techniques. Instruments for data collection were Enforcement of Discipline Inventory (ENDIN) and Teacher Productivity Scale (TPSC). They were constructed by the researcher and validated by three research experts. Enforcement of Discipline Inventory yielded a reliability coefficient of .69 while Teacher Productivity Scale yielded a reliability coefficient of .70 obtained through Cronbach Alpha method. Statistical tools for data analyses in Adoga's study were simple percentage (for answering research questions) and spearman's correlational coefficient for hypotheses testing.

Adoga found that a strong positive correlation existed between Enforcement of discipline and teacher productivity among

highly experienced and less experienced secondary school principals in Federal Capital Territory, Abuja. The relationship was same for highly experienced and less experienced secondary school principals in Adoga's study. Adoga's study was limited to Enforcement of discipline, teacher productivity and principals' gender while this study extended its coverage to Enforcement of discipline, staff welfare, staff training, performance appraisal, internal supervision, teacher productivity, and principals' gender. Adoga answered research questions using simple percentage while Pearson's product moment correlation coefficient was used to answer research questions in this study. Adoga tested hypothesis with spearman's correlation coefficient while regression analyses was used for hypothesis testing in this study. Notwithstanding these differences, Adoga's study is useful to this present study in many ways; both studies treated same variables such as Enforcement of discipline, teacher productivity and principals' gender. Both studies adopted similar research design, and instrumentation. Consequently, Adoga's study cannot be neglected in a study such as this present one.

Sciz (2017) conducted a study on Enforcement of discipline and teacher productivity in high schools in Central Hong Kong. Design of the study was Ex-Post Facto. Five research questions and five hypotheses guided the study. Sample for the study was 280 high school principals drawn using simple random sampling technique. Sciz collected data with a 32-item structured questionnaire, used mean with standard deviation to answer research questions and t-test for testing hypothesis.

Major findings of Sciz's study indicated a strong positive correlation between principals' Enforcement of discipline and teacher productivity in Central Hong Kong. The relationship was stronger with male high school principals than with their female counterparts. Sciz's study differed from this present work in choice of research design, statistical tools for data analyses, instrumentation and scope. Notwithstanding, Sciz's work relate with this study since Enforcement of discipline, teacher productivity and principals' gender are variables in this study and Sciz's. As a result, Sciz's work will aid inferences in this study.

Nwankwo (2019) investigated the predictive relationship between Enforcement of discipline and teacher productivity in secondary schools in Abia State. It was a causal comparative study guided by two research questions and two hypothesis. Using proportionate and simple random sampling techniques, Nwankwo drew a sample of 188 secondary school principals from urban and rural areas in Abia state. Nwankwo adopted readymade instruments, namely Enforcement of Discipline Scale (ENDSC) and Teacher Productivity Questionnaire (TPQU) for data collection. Mean statistic was used to answer the research questions while t-test statistic was used to test hypothesis at 0.05 significant level.

Nwankwo reported that their existed a strong predictive relationship between principals' Enforcement of discipline and teacher productivity in urban and rural areas of Abia state. The relationship was stronger among secondary school principals in rural areas than their counterparts in the urban areas. Nwankwo's study differed from this work in design, data analysis and scope. Also, Nwankwo was interested in school location (urban/rural) while this study was principals' gender. Both studies relate closely since Enforcement of discipline, teacher productivity and principals' gender were core variables in both studies. Thus, Nwankwo's study is relevant to this present work.

Abubakar (2018) in a study titled influence of Enforcement of discipline on Teacher productivity in secondary schools in Kaduna state. The design used was correlation research design and was guided by three research questions and three hypotheses. Sample for the study was 322 secondary school principals in Kaduna state. The sample was made up of 101 males and 221 females. Two instruments namely Enforcement of Discipline Questionnaire (EDQU) and Teacher Productivity Questionnaire (TEPQ) were used for data collection in the study. The instruments were constructed by the researcher and validated by three research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Abubakar reported that principals' Enforcement of discipline had a strong positive correlation with

teacher productivity in the area. The relationship was stronger with female secondary school principals than with their male counterparts. Abubakar treated only Enforcement of discipline, teacher productivity and principals' gender while this study treated Enforcement of discipline, staff welfare, staff training, performance appraisal, internal supervision, teacher productivity and principals' gender. On the other hand, Abubakar adopted similar research design with that of this study. Also, Abubakar's study is consistent with this study in choice of statistical tools for testing hypotheses. In the same vein, all the variables in Abubakar's study constituted major components of this present study. Hence, both studies are related.

From the empirical studies reviewed above, majority of the researchers found strong relationship among principals' managerial functions, teacher productivity and principals' gender. While a few others found the contrary. This conflicting findings constitute the major gap this study seeks to bridge. However, a few others found no significant predictive relationship among depression, stigmatization and marital conflict with respect to parents of autistic children. With regards to gender influence, many of the researchers found a significant influence, more on females than males. Others found significant influence more on males than females. Whereas, a few others reported that gender had no significant influence on the topic of discourse. Hence, the gap of no definitive conclusion exists, justifying this present study.

CHAPTER 29

Topic:

EFFECTS OF COMPUTER AIDED INSTRUCTION ON SECONDARY SCHOOL STUDENTS' INTEREST, ACADEMIC ACHIEVEMENT AND RETENTION IN COMPUTER STUDIES IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Students' Interest in Computer Studies

Natshi (2020) investigated the effect of Computer Aided Instruction on students' interest in computer studies in Kenya, Central Africa. Natshi sampled two schools, one in an urban city, and the other in a rural community all in Kenya, Central Africa. Natshi's interest was to determine if there existed significant difference between urban and rural students' interest in computer studies when thought with CAI. That is, influence of their school location on their interest in computer studies when taught with CAI. Quasi experimental research design was adopted for the study. Four research questions and five hypotheses guided the study. Computer Studies Interest Scale (CIS) constructed by the researcher was used for data collection. CIS was used to obtain the pretest and posttest interest scores. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses. Four non-equivalent intact classes drawn from two schools were used. Two classes were drawn from the urban school and the other two classes from the rural school.

Major findings of the study revealed that students taught the selected computer studies topics with Computer Aided Instruction showed higher interest in computer studies than their counterparts who were taught the same topics with expository method. Location of schools had no significant effect on students' interest in computer studies when taught with Computer Aided Instruction. This study draws much relevance from Natshi's work as both studies

investigate the effect of Computer Aided Instruction on students' interest in computer studies. However, while Natshi studied location of school factor, this work is interested in school ownership.

Akpan (2023) sought to establish the effect of Computer Aided Instruction on students' interest in Computer Studies in Uyo Metropolis, Akwa-Ibom State. It was an experimental study, specifically, a quasi-experiment. Eight intact classes were drawn from two public and two private secondary schools in Uyo Metropolis, Akwa-Ibom state. Simple random sampling technique was used for drawing the schools, drawing the eight intact classes (two from each school) and assigning the intact classes to randomly to experimental and the other to control group. Experimental groups were taught with Computer Aided Instruction while the control groups were taught with expository method. Computer Studies Interest Inventory (CSII) was used to collect interest scores before and after the teaching. Mean and Analysis of Covariance (ANCOVA) were used for data analyses.

Akpan reported that the experimental group who were taught the selected Computer Studies topics with Computer Aided Instruction had lower interest in Computer Studies than the control groups who were taught the same topics with expository method. Akpan's work is also very consistent with this present study. However, this study is wider in scope than Akpan's.

Hassan (2023) in a quasi-experimental study attempted to determine students' interest in computer studies through Computer Aided Instruction in secondary schools in Auchi, Edo state. Pretest-posttest control group design was adopted for the study. Eight non-equivalent intact classes were randomly drawn from two public and two private schools. Computer Studies Interest Scale (CSIS) was used to obtain the pretest and posttest interest scores. Four research questions and four hypotheses guided the study. According to Hassan, major findings showed that students taught Computer Studies using Computer Aided Instruction showed higher interest than their counterparts who were taught same topics with expository method. Hassan further reported that private school students showed higher interest than their public school's counterparts in both control and experimental groups. Hassan's work is very consistent with this

present study both in content and design. However, this work is an improvement since it addresses more than students' interest in Computer Studies. In addition to students' interest, this study shall investigate students' achievement and retention in Computer Studies. Form the foregoings, studies on students' interest in computer studies through Computer Aided Instruction in secondary schools have shown conflicting findings. Thus, this study is timely and justified.

Students' Academic Achievement in Computer Studies

Olayinka (2019) studied the effect of Computer Aided Instruction on students' achievement in Computer Studies in Ilorin, Kwara state. The design of the study was quasi experimental, specifically pre-test post-test control group. The study was carried out in Ilorin, Kwara state where a sample of 55 students consisting of 30 males and 25 females from two intact classes was used for the study. The two intact classes were randomly assigned experimental and control groups. Three research questions and three hypotheses guided the study. Computer Studies Achievement Test (CSAT) was used for data collection. Mean, standard deviation and t-test statistics were used for data analyses. Results obtained revealed that Computer Aided Instruction was more effective and enhanced students' achievement in Computer Studies than the lecture methods. The work of Olayinka is similar to this work in design and content. However, this study shall adopt ANCOVA for hypotheses testing (not t-test). This study also shall address influence of school ownership not students gender. In the same vein, this study shall adopt larger sample than the one adopted by Olayinka.

George (2020) in a study titled Computer Aided Instruction and its effect on students' academic achievement in Computer studies in Washington D.C. USA. It was a quasi-experimental study, pretest-posttest, non-equivalent control group design was used. A total of 728 secondary school students were drawn from intact classes in six schools in Washington D.C USA. Intact classes were randomly assigned experimental and control groups. Six research questions and six hypotheses guided the study. Mean and standard

deviation were used to answer the research questions while the hypotheses were tested at .05 level of significance using z-test.

Major findings of the study revealed that the students taught Computer studies with Computer Aided Instruction, achieved higher than their counterparts taught with expository method. There was no significant difference between the achievement scores of male and female students taught Computer studies with Computer Aided Instruction. George treated the concept of students' gender while this study is interested in school ownership. Both studies adopted same research design but differed in hypotheses testing. However, this work is an expansion since it addresses more than students' achievement in Computer Studies. In addition to students' achievement, this study shall investigate students' interest and retention in Computer Studies. Form the foregoings, studies on students' interest in computer studies through Computer Aided Instruction in secondary schools have shown conflicting findings. Thus, this study is timely and justified.

Nneji and Udabah (2020) attempted to determine the effect of Computer Aided Instruction on secondary school education students' achievement and retention in Computer Studies in Enugu state. Four research questions and six hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. The study was conducted in all the six education zones in Enugu State, where a sample of 480 students was drawn from 12 intact classes in 6 schools (one from each education zone in Enugu state). Techniques adopted for sampling was purposive and stratified random sampling. Instrument used for data collection was Computer Studies Achievement Test (CSAT). The instrument was constructed by the researchers and validated by three research experts. CSAT had 30 multiple choice items each with 4 options. It yielded a stability coefficient of .78 obtained through test–retest approach. CSAT also yielded a reliability coefficient of .82 obtained by Kudar-Richardson 20 formula. Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA).

Major findings of the study showed that students taught Computer Studies with Computer Aided Instruction achieved higher

and retained more than their counterparts taught same topics with expository method. Also, male and female students did not differ significantly in their achievement and retention in Computer Studies when taught with Computer Aided Instruction. Nneji and Udabah studied achievement and retention in Computer Studies but this study is interested in students' achievement, interest and retention in Computer Studies. Notwithstanding, the study of Nneji and Udabah is very much useful to this study as both investigated the effect of Computer Aided Instruction. Also, area of study (Enugu state) is the same for both studies. Most importantly, the design and tools for data analyses in both studies are similar.

Baraje (2019) conducted a study on improving academic achievement of secondary school students in Computer Studies through Computer Aided Instruction in Cape Town. Baraje adopted a non-equivalent quasi-experimental design. A sample of 292 students was drawn from four single schools in Cape Town. Data collection for the study was done using Computer Studies Achievement Test (CSAT). Mean, standard deviation and Analysis of covariance (ANCOVA) were used for data analyses. Result of the study revealed that students achieved lower in Computer Studies with lecture method than when taught with Computer Aided Instruction. Baraje's study is very consistent with this study in content and design. Hence, it will be useful in drawing inference in this study. Summarily, studies on improving academic achievement of secondary school students in Computer Studies through Computer Aided Instruction yielded no definitive conclusion status. Consequently, justifying the need for more studies such as this present one which aims at determining the effect of Computer Aided Instruction on secondary school students' achievement, interest and retention in Computer Studies in Cape Town.

Students' Retention in Computer Studies

Julius (2019) in a Quasi experimental research design conducted a study on enhancing retention of computer studies concepts through Computer Aided Instruction in high schools in Scotland. Julius's sampled four schools, two in an urban city, and the other two in a rural community all in Scotland. Julius's interest

was to determine if there existed significant difference between the retention of the learners with regard to the location of their schools and the strategies used in teaching them. Six research questions and six hypotheses guided the study. Computer Studies Retention Test (CSRT) constructed by the researcher was used for data collection. CSRT was used to obtain the retention scores. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) were used to test the hypotheses. Eight non-equivalent intact classes drawn from the four schools (two urban and two rural) were used.

Major findings of the study revealed that students taught the selected Computer Studies concepts with Computer Aided Instruction retained more Computer Studies than their counterparts taught same topics with lecture method. Location of schools had significant effect on students' retention in when taught with Computer Aided Instruction in favour of rural school's students. This present study draws much relevance from Julius's work. However, while Julius studied location of school factor, this work is interested in school ownership.

Oluremi (2023) in a study titled effect of Computer Aided Instruction on secondary school students' retention in Shagamu Ogun state adopted a quasi-experimental study. Pretest-posttest, non-equivalent control group design was used. A total of 692 students were drawn from intact classes in the six secondary school schools in Shagamu Ogun state. Intact classes were randomly assigned experimental and control groups. Six research questions and six hypotheses guided the study. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at .05 level of significance using z-test. Major findings of the study revealed that students taught with Computer Aided Instruction retained more than their counterparts taught with lecture method. There was no significant difference between the retention scores of male and female students taught with Computer Aided Instruction. Oluremi's study is related to this study in content and design. However, Oluremi was interested in students' gender while this study is interested in school ownership.

Buckie (2020) investigated the effect of Computer Aided Instruction on students' retention in computer studies in in Michigan, USA. Buckie sampled two schools, one in an urban city, and the other in a rural community all in Kenya, Central Africa. Buckie's retention was to determine if there existed significant difference between urban and rural students' retention in computer studies when thought with CAI. That is, influence of their school location on their interest in computer studies when taught with CAI. Quasi experimental research design was adopted for the study. Four research questions and five hypotheses guided the study. Computer Studies Retention Test (CSRT) was used to obtain the retention scores. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses. Four non-equivalent intact classes drawn from two schools were used. Two classes were drawn from the urban school and the other two classes from the rural school.

Major findings of the study revealed that students taught the selected computer studies topics with Computer Aided Instruction retained more in computer studies than their counterparts who were taught the same topics with expository method. Location of schools had no significant effect on students' retention in computer studies when taught with Computer Aided Instruction. This study draws much relevance from Buckie's work as both studies investigate the effect of Computer Aided Instruction on students' retention in computer studies. However, while Buckie studied location of school factor, this work is interested in school ownership.

Influence of School Ownership on Students' Interest, Academic Achievement and Retention in Computer Studies

Donald (2020) in a quasi-experimental study attempted to determine the effect of Computer Aided Instruction on students' interest, Achievement and retention in Computer Studies in Seattle, Washington State, USA. Pretest-posttest control group design was adopted for the study. Ten non-equivalent intact classes were randomly drawn from two public and two private schools. Computer Studies Retention Test (CSRT) and Computer Studies Interest Inventory (COSII) were used data collection. Six research questions

and nine hypotheses guided the study. Purposive and simple random sampling techniques where used to draw a sample of 1,850 high school students. Out of this sample 940 was drawn from public and 910 from private high schools. Data collected were analyzed using mean and standard deviation to answer research questions while hypotheses were tested with ANCOVA at 0.05 level of significance. According to Donald, major findings showed that students taught Computer Studies with lecture method and their counterparts taught same topics with Computer Aided Instruction did not differ significantly in their interest, Achievement and Retention in Computer Studies. Similarly, public and private schools' students in the study did not differ significantly in their Interest, Achievement and Retention in Computer Studies. Donald's work is very consistent with this present study both in content and design. From the foregoing's, studies on effect of Computer Aided Instruction on public and private schools students' interest, academic achievement and retention in Computer Studies have shown conflicting findings. Hence, the need for this study.

Nuhu (2019) attempted to determine the effect of Computer Aided Instruction on public secondary school education students' achievement and retention in Computer Studies in Zaria, Kaduna state. Four research questions and six hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. The study was conducted in all the six education zones in Enugu State, where a sample of 480 students was drawn from 8 intact classes in 4 schools. Techniques adopted for sampling was purposive and stratified random sampling. Instrument used for data collection was Computer Studies Achievement Test (CSAT). The instrument was constructed by the researchers and validated by three research experts. CSAT had 30 multiple choice items each with 4 options. It yielded a stability coefficient of .78 obtained through test–retest approach. CSAT also yielded a reliability coefficient of .82 obtained by Kudar-Richardson 20 formula. Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA).

Major findings of the study showed that students taught Computer Studies with Computer Aided Instruction achieved higher

and retained more than their counterparts taught same topics with expository method. Also, public secondary school students did not differ significantly in their achievement and retention in Computer Studies when taught with Computer Aided Instruction. Notwithstanding, the study of Nuhu is very much useful to this study as both studies adopted same concepts (Computer Aided Instruction, achievement and retention and school location). Also, area of study (Enugu state) is the same for both studies. Most importantly, the design and tools for data analyses in both studies are similar.

Derbuck (2023) in a quasi-experimental study attempted to determine the effect of Computer Aided Instruction on private secondary school students' achievement and interest in Computer Studies in Southern Educational District of Singapore. Derbuck adopted a non-equivalent quasi-experimental design. A sample of 292 students was drawn from four private schools in Southern Educational District of Singapore. Three research questions and six hypotheses guided the study. Computer Studies Achievement Test (CSAT) and Computer Studies Interest Inventory (COSII) were used data collection. Mean, standard deviation and Analysis of covariance (ANCOVA) were used for data analyses. Major findings showed that students taught Computer Studies with lecture method and their counterparts taught same topics with Computer Aided Instruction did not differ significantly in their achievement and interest in Computer Studies.

Similarly, private schools' students in the study did not differ significantly in their achievement and interest in Computer Studies. Derbuck's work is very consistent with this present study both in content and design. From the foregoing's, studies on effect of Computer Aided Instruction on private schools students' academic achievement and interest in Computer Studies have shown conflicting findings. Hence, the need for this study.

Imuno (2019) aimed at investigating the influence of public and private secondary schools' students on the effectiveness of Computer Aided Instruction in Computer Studies in Uyo Metropolis, Akwa-Ibom State. It was an experimental study, specifically, a quasi-experiment. Eight intact classes were drawn from two public and two private secondary schools in Uyo

Metropolis, Akwa-Ibom state. Simple random sampling technique was used for drawing the schools, drawing the eight intact classes (two from each school) and assigning the intact classes to randomly to experimental and the other to control group. Experimental groups were taught with Computer Aided Instruction while the control groups were taught with expository method. Computer Studies Interest Inventory (CSII) was used to collect interest scores before and after the teaching. Mean and Analysis of Covariance (ANCOVA) were used for data analyses. Imuno reported that the experimental group who were taught the Computer Studies with Computer Aided Instruction showed higher interest in Computer Studies than the control groups who were taught the same topics with expository method. Also private school students showed higher interest in Computer Studies than their counterparts in public schools. Indeed, Imuno's study is consistent with this present work.

Wale (2020) studied the effect of Computer Aided Instruction on secondary school students' interest and retention in Computer Studies in Shagamu, Ogun State. The design of the study was quasi experimental, specifically pre-test post-test control group. The study was carried out in Shagamu, Ogun State where a sample of 162 students consisting of 88 students in public and 74 students in private schools. The four intact classes were randomly assigned experimental and control groups. Four research questions and six hypotheses guided the study. Computer Studies Interest Scale (CSIS) was used for data collection. Mean, standard deviation and t-test statistics were used for data analyses. Results obtained revealed that Computer Aided Instruction was more effective and enhanced students' retention and showed higher interest in Computer Studies than the lecture method. Public school students showed higher interest and retained more than their private schools' counterparts in the experimental groups.

CHAPTER 30

Topic:

DEPRESSION AND STIGMATIZATION AS PREDICTORS OF MARITALCONFLICT AMONG PARENTS WITH AUTISTIC CHILDREN IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Studies on Depression, Stigmatization and Parenting Role Conflict among Male and Female Parents With Autistic Children

Smith (2020) conducted a study to determine the relationship between depression and parenting role conflict among male and female parents with autistic children in Ohio State of USA. The design used was correlational research design and was guided by four research questions and four hypotheses. The population for the study was 126 parents with autistic children in the area under study, from which a sample of 95 parents (34 males and 61 females) was drawn using stratified, purposive and simple random sampling techniques. Instruments for data collection were depression inventory and parenting role conflict scale. They were constructed by the researcher and validated by three research experts. Depression inventory yielded a reliability coefficient of .78 while parenting role conflict scale yielded a reliability coefficient of .76 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Smith's study were mean with standard deviation (for answering research questions) and spearman's correlation coefficient for hypotheses testing.

Smith found that a strong positive correlation existed between depression and parenting role conflict among male and female parents with autistic children in Ohio State of USA. The relationship was same for male and female parents with autistic

children. Smith's study was limited to depression and parenting role conflict while this study extended its coverage to stigmatization and four other indices of marital conflict. Smith answered research questions using mean and standard deviation while Pearson's product moment correlation coefficients was used to answer research questions in this study. Smith tested hypothesis with spearman's correlational coefficients while regression analyses was used for hypothesis testing in this study. Notwithstanding these differences, Smith's study was useful to this present study in many ways; both studies treated same variables such as depression, parenting role conflict and gender. Both studies adopted similar research design, and instrumentation. Consequently, Smith's study cannot be neglected in a study such as this present one.

Obome (2018) conducted a study titled depression: predictor of parenting role conflict among parents of autistic children in Afikpo Ebonyi state. Correlational research design was adopted in the study. Three research questions and three hypotheses guided the study. Sample for the study was 25 identified parents of autistic children in Afikpo Ebonyi state as at the time of the study. Two instruments were used for data collection in the study. One was parental depression questionnaire and the other was parenting role conflict questionnaire. The instruments were constructed by the research and validated by five research experts. Pearson Product Moment Correlation Coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Obome reported that parental depression had a strong positive correlation with parenting role conflict among parents of autistic children in the area. The relationship was stronger with female parents than with their male counterparts. Obome treated only depression, parenting role conflict and gender while this study treated depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender. On the other hand, Obome adopted similar research design with that of this study. Also, Obome's study is consistent with this study in choice of statistical tools for data analysis. Most

importantly, all the variables in Obome's study constitute major components of this present study. Hence, both studies are related.

Ademola (2017) conducted a cross sectional study of gender difference in parenting role conflict among depressed male and female parents with autistic children in Akure, Ondo state. Design of the study was Ex-Post Facto. Five research questions and five hypotheses guided the study. Sample of the study was 36 depressed parents with autistic children (16 male and 20 female) in Akure, Ondo state drawn through proportionate and simple random sampling techniques. Ademola collected data with a structured questionnaire and used mean with standard deviation to answer research questions and t-test for testing hypothesis.

Major findings of Ademola's study revealed a strong positive correlation between depression and parenting role conflict. The relationship was stronger with male parents than with their female counterparts. Ademola's study differed from this present work in choice of research design, statistical tools for data analyses, instrumentation and scope. Notwithstanding, Ademola's work is related to this study since depression, parenting role conflict and gender were variables in this study and Ademola's. As a result, Ademola's work aided inferences in this study.

Harry (2017) investigated the relationship between depression and parenting role conflict among parents of autistic children in Colorado, USA. Correlational research design was adopted in the study. Three research questions and two hypotheses guided the study. Sample for the study was 185 parents drawn from a population of 290 parents of autistic children in Colorado. The sampling was done using cluster and simple random sampling techniques. Two questionnaires were used for data collection, one on depression and the other on parenting role conflict. The instruments were constructed by the research and validated by three research experts. Mean and standard deviation were used to answer research questions while Spearman correlation coefficient was used to test hypothesis.

In the major findings, Harry reported a weak correlation between depression and parenting role conflict among the sample drawn for the study. The relationship was same for male and female

parents of autistic children in the area Harry studied. Harry's study and this present work relate in content, instrumentation and design. However, this study is wider in scope than Harry's study. Also, both studies differed in choice of statistical tools for data analysis. Nevertheless, Harry's study was useful in discussion of findings of this present study where veritable comparisons were made.

Mbang (2019) conducted a study on predictive tendencies between stigmatization and parenting role conflict in Calabar, Cross River state. It was a causal comparative study guided by four research questions and four hypothesis. Using proportionate and simple random sampling techniques, Mbang drew a sample of 65 (23 males and 42 females) parents whose autistic children were found in government owned rehabilitation center in Calabar. Stigmatization Identification Scale (SIC) and Parenting role conflict questionnaire (PRCQ) were used for data collection. Simple percentage was used to answer the research questions while t-test statistic was used to test hypothesis at 0.05 significant level.

Mbang found a strong predictive tendency between parental stigmatization and parenting role conflict. The relationship was stronger among female parents of autistic children than their male counterpart in the study. Mbang's study differed from this work in design, data analysis and scope. Both studies asre closely related since parental stigmatization, parenting role conflict and gender were core variables in both studies. Thus, Mbang's study is relevant to this present work.

Jinadu (2017) examined the correlation between parenting role conflict and autistism based stigmatization in Bauchi state. Correlational research design was adopted in the study. Jinadu formulated four research questions and three hypotheses. Instruments for data collection were a 23-item parental stigmatization questionnaire (PASQ) and a 19-item parenting role conflict scale (PARCOS). Both instrument were constructed by the researcher and validated by research experts. PASQ yielded a reliability of .81 while PARCOS yielded a reliability of .79. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Jinadu found that parental stigmatization had a strong positive correlation with parenting role conflict among parents of autistic children in the study. The relationship was stronger with male parents than their female counterparts. Jinadu's study covered stigmatization, parenting role conflict and gender while this study covers depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender. Hence, this study is wider in scope than Jinadu's. Despite this difference, Jinadu's study and this present work are closely related in many ways. Foremost, Jinadu adopted similar research design with that of this study. Also, Jinadu's study is consistent with this study in choice of statistical tools for testing hypotheses. Most importantly, the major variables in Jinadu's work were also part of this present study. Hence, Jinadu's work was useful to this study especially in discussion of findings.

Studies on Depression, Stigmatization and Marital Verbal Conflict among Male and Female Parents With Autistic Children

McDonald (2020) attempted to determine the influence of depression on verbal conflicts among married couples with autistic children in Kentucky, USA. It was a descriptive survey guided by four research questions and four hypotheses. A total of 430 couples served as sample for the study. The sample was made of 185 males and 245 females. A structured questionnaire was used for data collection. The questionnaire was made up of 28-items scored on a four point scale. The researcher constructed the questionnaire and subjected it to validation by three experts. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at 0.05 level of significance using Analyses of Variance (ANOVA).

Major findings of the study revealed that depression influenced verbal conflicts among married couples with autistic children to a very great extent. The influence was more significant among male couples than their female counterparts. McDonald's study is related to this work because both studies considered

depression, marital verbal conflict and gender as main variables. However, McDonald's study differed from this study in design, instrumentation and data analyses. Also they differed in scope where McDonald studied only depression, marital verbal conflict and gender whereas this study extended its coverage to stigmatization and four other indices of marital conflict. Yet, McDonald's study aided inferences and comparisons in this study.

Alaje (2017) conducted a study on relationship between depression and verbal conflict among parents with autistic children in Ibadan metropolis, Oyo state. The design used was correlational design and was guided by four research questions and four hypotheses. The population for the study was 382 parents whose autistic children were receiving therapy in government owned facilities within Ibadan metropolis. Out of this population, Alaje sampled 191 parents representing 50% of the population. Simple random sampling technique was used to draw the sample from two clusters (well-educated and less educated parents). Instruments for data collection were Depression Inventory and Marital Conflict Questionnaire (MLQ). Depression Inventory was made up of 20 items while Marital Conflict Questionnaire consisted of 28 items. Both instruments were constructed by the researcher and validated by research expert. Pearson product moment correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analyses.

In the major findings, Alaje reported that depression had a strong positive correlation with marital verbal conflict among parents of autistic children in the area. The relationship was same for well-educated and less educated parents with autistic children. Alaje's study was limited to depression and verbal conflict while this study extended its coverage to stigmatization and four other indices of marital conflict. Alaje was interested in the educational level of parents while this study was interested in gender. On the other hand, Alaje adopted similar research design and instrumentation with that of this study. Also, Alaje's study is consistent in this study in choice of statistical tools for answering research questions and testing hypotheses. In the same vein, major variables in Alaje's study (depression and marital verbal conflict)

constitute major components of this present study. Hence, Alaje's work was found useful to this work.

Ngugah (2017) investigated the relationship among depression, marital verbal conflict and sexually transmitted diseases within couples with autistic children in Satellite settlement surrounding Nairobi, Kenya. Correlational research design was adopted in the study. Five research questions and two hypotheses guided the study. Sample for the study was 780 parents drawn from a population of 1,059 parents of autistic children in Satellite settlement surrounding Nairobi, Kenya during the study. The sampling was done using cluster and simple random sampling techniques. Three questionnaires were used for data collection, one on depression, and another on marital verbal conflict and the other on sexually transmitted diseases. The instruments were constructed by the research and validated by five research experts. Research questions were answered using simple percentage while hypothese were tested at .05 significant level using Analysis of Variance (ANOVA).

In the major findings, Ngugah reported a strong correlation among the key variables (depression, marital verbal conflict and sexually transmitted diseases). The relationship was same for male and female parents of autistic children in the study. Ngugah's study and this present work relate in content, instrumentation and design. On the otherhand, this study was wider in scope than Ngugah's study. Also, both studies differed in choice of statistical tools for data analysis. Moreso, Ngugah studied sexually transmitted diseases which was not part of this present study. Nevertheless, Ngugah's study was useful in discussion of findings in this present study.

Marshal (2020) conducted a study to establish the relationship between marital conflict and stigmatization among couples with autistic children in East London, UK. The design used was correlational survey design and was guided by three research questions and two hypotheses. A sample of 79 respondents was drawn for the study using stratified, purposive and simple random sampling techniques. Instruments for data collection were stigmatization scale (STIS) and marital conflict questionnaire (MACOQ). They were constructed by the researcher and validated

by three research experts. STIS yielded a reliability coefficient of .79 while MACOQ gave a reliability of .81 all obtained through Cronbach's Alpha method. Statistical tools for data analyses were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Marshal found that stigmatization had a very weak correlation with marital conflict among the respondents. The correlation was same for male and female respondents. Marshal's study is related to this work in design, content and instrumentation. Both studies considered stigmatization, marital conflict and gender as main variables. However, Marshal's study differed from this study in data analyses and scope. Notwithstanding, Marshal's study aided useful comparisons in this study.

Marua (2018) investigated the extent to which autism-based stigmatization could predict verbal conflict among married couples in Gombe state. Correlational research design was adopted in the study. Four research questions and four hypotheses guided the study. Sample for the study was 68 parents of autistic children in Gombe state. Data collection was done with stigmatization identifier (STID) and verbal conflict questionnaire (VECOQ). STID had 33 items while VECOQ had 25 items. Both instruments proved to be reliable in Cronbach's alpha analyses where STID yielded a reliability coefficient of .88 and VECOQ yielded a reliability coefficient of .92. Pearson product moment correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analysis.

In the major findings, Marua reported that autism-based stigmatization had a strong positive correlation with verbal conflict among married couples. The relationship was stronger among parents in rural areas than their counterparts in the urban areas. Variables in Marua's study included stigmatization, marital verbal conflict and location of respondents while this study covered parenting role conflict, stigmatization, depression, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender of respondents. Marua was interested in location of respondents while this researcher was interested in gender of respondents. On the other hand, Marua adopted similar

research design and instrumentation with those of this study. Both studies also adopted same statistical tools for data analyses. Hence, both studies were closely related.

Adung (2018) examined role of stigmatization on marital conflict and spread of HIV/AIDs in Ikom Local Government Area of Cross-River state. Descriptive research design was adopted in the study. Three research questions and three hypotheses guided the study. Sample for the study was 113 respondents drawn using simple random sampling technique. A questionnaire made up of 30 item was used for data collection in the study. The instrument was constructed by the research and validated by three research experts. Mean with standard deviation was used to answer the research questions while hypotheses were tested using z-test statistics.

In the major findings, Adung reported that stigmatization could cause both marital conflicts and spread of HIV/AIDs. Female respondents rated higher in favor of this finding than their male counterparts. Adung treated only stigmatization, marital conflict and gender while this study treats depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender. Adung also differed from this study in choice of design, instrumentation and tools for data analyses. Not minding, Adung's work was very useful to this study since Adung's major variables (stigmatization, marital conflict and gender) form major components of this study.

Studies on Depression, Stigmatization and Marital Physical Conflict among Male and Female Parents With Autistic Children

Preesha (2019) investigated the influence of depression on Marital Physical Conflict among parents of autistic children in Delhi, India. It was a descriptive survey guided by four research questions and four hypothesis. Preesha drew a sample of 88 (31 males and 57 females) parents of autistic children using proportionate and simple random sampling techniques. A structured questionnaire made up of 35-items was used for data collection.

Mean statistic was used to answer the research questions while t-test statistic was used to test hypothesis at 0.05 significant level.

Preesha found a strong influence of depression on Marital Physical Conflict among the sample. The relationship was stronger among younger parents of autistic children than their older counterpart in the study. Preesha's study differed from this work in design, data analysis and scope. Also, Preesha was interested in comparison of older and younger parents instead of gender (male/female) considered in this study. Both studies relate closely since parental depression and Marital Physical Conflict were core variables in both studies. Thus, Preesha's study is relevant to this present work.

Okoro (2018) conducted a study on influence of gender on Marital Physical Conflict among depressed male and female parents with autistic children in Owerri, Imo state. Design of the study was Causal comparative. Three research questions and three hypotheses guided the study. Sample of the study was 53 identified depressed parents with autistic children in Owerri, Imo state drawn through proportionate and simple random sampling techniques. Okoro collected data with a structured questionnaire and used simple percentage to answer research questions and z-test statistic for testing hypothesis.

Major findings of Okoro's study revealed that depression had a strong influence on Marital Physical Conflict among the sample. The relationship was stronger with female parents than their male counterparts. Okoro's study differed from this present work in choice of research design, statistical tools for data analyses, instrumentation and scope. Notwithstanding, Okoro's work relates with this study since depression, Marital Physical Conflict and gender were variables treated in this study and Okoro's. Consequently, Okoro's work aided inferences in this study.

Yandev (2020) conducted a study to determine the relationship between parental stigmatization and Marital Physical Conflict among parents with autistic children in Gboko, Benue state. Yandev adopted correlational research design guided by two research questions and two hypotheses. The population for the study was 64 parents with autistic children in Government owned Facility

in the area. Yandev used the entire population as sample for the study. Instruments for data collection were stigmatization inventory (STI) and Marital Physical Conflict questionnaire (MPCQ). They were constructed by the researcher and validated by three research experts. STI yielded a reliability coefficient of .83 while MPCQ yielded a reliability coefficient of .85 obtained through Cronbach's Alpha method. Yandev analyzed data using mean with standard deviation (for answering research questions) and spearman's correlation coefficient for hypotheses testing.

In the major findings, Yandev reported that a strong positive correlation existed between parental stigmatization and Marital Physical Conflict among the parents. The relationship was same for male and female parents with autistic children. Yandev's study was limited to stigmatization and Marital Physical Conflict while this study extended its coverage to depression and four other indices of marital conflict. Yandev answered research questions using mean and standard deviation while Pearson's product moment correlation coefficient was used to answer research questions in this study. Yandev tested hypotheses with spearman's correlation coefficients while regression analyses was used for hypothesis testing in this study. Notwithstanding these differences, Yandev's study was useful to this present study in many ways because both studies treated same variables such as stigmatization, Marital Physical Conflict and gender. Both studies adopted similar research design, and instrumentation. Consequently, Yandev's study cannot be neglected in a study such as this present one.

Davidson (2020) examined the correlation between stigmatization and Marital Physical Conflict among autistic children's parents in New York City, USA. Correlational research design was adopted in the study. Davidson formulated three research questions and three hypotheses. Instruments for data collection were parental stigmatization identifier (PASI) and Marital Physical Conflict scale (MPCOS). Both instrument were constructed by the researcher and validated by research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Davidson found a strong positive correlation between parental stigmatization and Marital Physical Conflict among the parents. The relationship was stronger with male parents than their female counterparts. Davidson's study covered stigmatization, Marital Physical Conflict and gender while this study covers depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender. Hence, this study is wider in scope than Davidson's. Despite this difference, Davidson's study and this present work are closely related in many ways. Foremost, Davidson adopted similar research design with that of this study. Also, Davidson's study is consistent with this study in choice of statistical tools for testing hypotheses. Most importantly, the major variables in Davidson's work were also part of this present study.

Baro (2018) investigated the extent to which stigmatization could predict Marital Physical Conflict among parents of autistic children in Yenogoa, Bayelsa state. Correlational research design was adopted in the study. Three research questions and three hypotheses guided the study. Sample for the study was 48 parents of autistic children in Yenogoa, Bayelsa state. Two questionnaires were used for data collection in the study. One was stigmatization questionnaire and the other was Marital Physical Conflict questionnaire. The questionnaires were constructed by the research and validated by research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Baro reported that stigmatization had a strong positive correlation with Marital Physical Conflict among parents of autistic children in the area. The relationship was stronger with less experienced parents than their more experienced counterparts. Baro's variables included stigmatization, Marital Physical Conflict and experience of parents while this study covers depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender of parents. On the other hand, Baro adopted similar research design with that of this study. Also, Baro's

study is consistent with this study in choice of statistical tools for data analysis. Hence, both studies are related.

Abdullahi (2017) studied parental stigmatization as a predictor of Marital Physical Conflict among parents of autistic children in Lafia, Nasarawa state. Abdulahi adopted Correlational research design for the study. Four research questions and four hypotheses guided the study. Sample for the study was 67 parents drawn from a population of 113 parents of autistic children in Lafia, Nasarawa state. The sampling was done using proportionate and simple random sampling techniques. The sample consisted of 39 females and 28 males. Parental stigmatization Scale and Marital Physical Conflict scale were used for data collection in the study. The instruments were constructed by the research and validated by three research experts. Mean and standard deviation were used to answer research questions while Spearman correlation coefficient was used to test hypothesis.

Abdullahi found a strong positive correlation between parental stigmatization and Marital Physical Conflict among the sample drawn for the study. The relationship was same for male and female parents sampled in the study. Abdulahi's study and this present work relate in content, instrumentation and design. However, this study is wider in scope than Abdulahi's study. Also, both studies differed in choice of statistical tools for data analysis. Notwithstanding, Abdulahi's study was useful in discussion of findings of this present study where comparisons were made.

Studies on Depression, Stigmatization and Marital Economic Conflict among Male and Female Parents With Autistic Children

Jackson (2020) examined the extent to which depression could elicit economic conflict among married couples with autistic children in Toronto, Canada. Correlational research design was adopted in the study. Four research questions and four hypotheses guided the study. Sample for the study was 48 parents of autistic children in Toronto, Canada. Data collection was done with depression inventory (DEIN) and economic conflict questionnaire (ECOQ). DEIN had 23 items while ECOQ had 28 items. The

instruments DEIN and ECOQ yielded reliability coefficients of .88 and .75 respectively. Pearson product moment correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analysis.

In the major findings, Jackson reported that depression had a strong positive correlation with economic conflict among married couples with autistic children. The relationship was stronger among parents in city Centre than their counterparts in the satellite locations. Jackson studied depression, marital economic conflict and location of respondents as variables while this study was concerned with parenting role conflict, depression, stigmatization, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender of respondents. Jackson was interested in location of respondents while this researcher was interested in gender of respondents. Interestingly, Jackson adopted similar research design and instrumentation with those of this study. Both studies also adopted same statistical tools for data analyses. Thus, Jackson's study was considered very relevant to this work.

Taswir (2019) conducted a study on relationship between depression and economic conflict among parents with autistic children in Katiba District of Namibia. The design used was correlational design and was guided by four research questions and four hypotheses. The population for the study was 228 parents whose autistic children were receiving therapy in registered rehabilitation centers. From this population, Taswir sampled 114 parents using simple random sampling technique. Instruments for data collection were Depression Inventory and Marital Conflict Questionnaire (MLQ). Depression Inventory was made up of 20 items while Marital Conflict Questionnaire consisted of 25 items. Both instruments were constructed by the researcher and validated by research expert. Pearson product moment correlation coefficient was used to answer the research questions while hypotheses were tested using Multiple Regression Analyses.

Major findings of the study reported that depression had a strong positive correlation with marital economic conflict among parents of autistic children in the area. The relationship was same for urban and rural respondents with autistic children. Taswir's

study was limited to depression and economic conflict while this study extended its coverage to stigmatization and four other indices of marital conflict. Taswir was interested in the location of parents while this study was interested in gender. Conversely, Taswir adopted similar research design and instrumentation with that of this study. Also, Taswir's study is consistent in this study in choice of statistical tools for answering research questions and testing hypotheses. Additionally, major variables in Taswir's study (depression and marital economic conflict) constitute major components of this present study. Hence, Taswir's work is useful to this present work.

Ogbonna (2017) conducted a study to find out the relationship between stigmatization and financial misunderstanding among couples with autistic children in Abia state. The design used was correlational survey design and was guided by three research questions and two hypotheses. A sample of 79 respondents was drawn for the study using stratified, purposive and simple random sampling techniques. Instruments for data collection were stigmatization scale (STS) and marital conflict questionnaire (MACOQ). They were constructed by the researcher and validated by three research experts. STS yielded a reliability coefficient of .79 while MACOQ gave a reliability of .81 all obtained through Cronbach's Alpha method. Statistical tools for data analyses were simple percentage (for answering research questions) and Analysis of Variance (ANOVA) for hypotheses testing.

Ogbonna found that stigmatization and financial misunderstanding had a very weak correlation among couples with autistic children. The correlation was same for male and female respondents. Ogbonna's study is related to this work in design, content and instrumentation. Both studies considered stigmatization, marital conflict and gender as main variables. However, Ogbonna's study differed from this study in data analyses and scope. Notwithstanding, Ogbonna's study aided useful comparisons in this study.

Kelly (2020) studied the influence of stigmatization on economic conflicts among married couples with autistic children in Dundee, Scotland. It was a descriptive survey guided by four

research questions and four hypotheses. A total of 430 couples served as sample for the study. The sample was made of 185 males and 245 females. A structured questionnaire was used for data collection. The questionnaire was made up of 28-items scored on a four point scale. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at 0.05 level of significance using Analyses of Variance (ANOVA).

Major findings of the study revealed that stigmatization influenced economic conflicts among married couples with autistic children to a very great extent. The influence was more significant among female couples than their male counterparts. Kelly's study is related to this work because both studies considered stigmatization, marital economic conflict and gender as main variables. However, Kelly's study differed from this study in design, instrumentation and data analyses. Also they differed in scope where Kelly studied only stigmatization, marital economic conflict and gender whereas this study extended its coverage to depression and four other indices of marital conflict. Yet, Kelly's study aided inferences and comparisons in this study.

Nathir (2019) examined correlation between stigmatization and economic squabble among families with autistic children in Northern India. Descriptive research design was adopted for the study. Three research questions and three hypotheses guided the study. Sample for the study was 123 respondents drawn using simple random sampling technique. A questionnaire made up of 30 item was used for data collection in the study. The instrument was constructed by the research and validated by three research experts. Mean with standard deviation was used to answer the research questions while hypotheses were tested using z-test statistics.

In the major findings, Nathir reported significant correlation between stigmatization and economic squabble among the sample drawn for the study. Male respondents rated higher in favor of this finding than their female counterparts. Nathir treated only stigmatization, marital conflict and gender while this study treated depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender. Nathir also differed from this study

in choice of design, instrumentation and tools for data analyses. Not minding, Nathir's work was very useful to this study since Nathir's major variables (stigmatization, marital conflict and gender) formed major components of this present study.

Kadiri (2017) investigated the relationship between stigmatization and marital economic conflict among couples with autistic children in Warri, Delta state. Correlational research design was adopted in the study. Five research questions and two hypotheses guided the study. Sample for the study was 680 parents drawn from a population of 1,290 parents of autistic children in Warri, Delta state during the study. The sampling was done using cluster and simple random sampling techniques. Two questionnaires were used for data collection, one on stigmatization and the other on marital economic conflict. The instruments were constructed by the research and validated by three research experts. Research questions were answered using mean with standard deviation while hypothese were tested at .05 significant level using z-test statistics.

Major findings of the study revealed a strong correlation among the key variables (stigmatization and marital economic conflict). The relationship was same for male and female parents of autistic children in the study. Kadiri's study and this present work relate in content, instrumentation and design. Contrarily, this study is wider in scope than Kadiri's study. Both studies differed in choice of statistical tools for data analysis. Nevertheless, Kadiri's study was useful in discussion of findings in this present study.

Studies on Depression, Stigmatization and Marital Sex Related Conflict among Male and Female Parents with Autistic Children

Hilton (2020) investigated the relationship between parental depression and Marital Sex Related Conflict among parents of autistic children in Cape Town, South Africa. Correlational research design was adopted in the study. Tow research questions and two hypotheses guided the study. Sample for the study was 205 parents drawn from a population of 555 parents of autistic children. Two instruments were used for data collection, one was Depression Measurement scale (DMS) and the other was Questionnaire on

Marital Sex Related Conflict (QUMSEC). Hilton constructed the instruments and subjected them to validation by three research experts. Mean statistic was used to answer research questions while Spearman correlation coefficient was used to test hypothesis.

In the major findings, Hilton reported no significant correlation between parental depression and Marital Sex Related Conflict among the sample drawn for the study. The relationship was same for male and female parents of autistic children in the area Hilton studied. Hilton's study and this present work relate in content instrumentation and design. However, this study is wider in scope than Hilton's study. Also, both studies differed in choice of statistical tools for data analysis. Nevertheless, Hilton's study was useful in discussion of findings of this present study where veritable comparisons were made.

Adikpe (2017) examined the correlation between Marital Sex Related Conflict and depression of parents with autistic children in Auchi, Edo State. Correlational research design was adopted in the study. Adikpe formulated three research questions and three hypotheses. Instruments for data collection were an 18-item Questionnaire on Parental Depression (QPAD) and a 20-item Inventory on Marital Sex Related Conflict (IMSRC). Both instrument were constructed by the researcher and validated by research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

Adikpe found that parental depression caused Marital Sex Related Conflict among parents of autistic children in the study. Hence, a strong positive relationship. The relationship was stronger with female parents than with their male counterparts. Adikpe's study covered depression, Marital Sex Related Conflict and gender while this study covers depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender. Hence, this study is wider in scope than Adikpe's. Despite this difference, Adikpe's study and this present work are closely related in many ways. In the first place, Adikpe adopted similar research design with that of this study. Also, Adikpe's study is consistent with this study

in choice of statistical tools for testing hypotheses. Most importantly, the major variables in Adikpe's work were also part of this present study.

Adoga (2020) conducted a study to determine the relationship between depression and Marital Sex Related Conflict among highly experienced and less experienced parents of autistic children in Federal Capital Territory, Abuja. The design used was correlational research design and was guided by three research questions and three hypotheses. Adoga drew a sample of 148 (51 males and 97 females) using proportionate and simple random sampling techniques. Instruments for data collection were Parental depression inventory and Marital Conflict Scale. They were constructed by the researcher and validated by three research experts. Depression inventory yielded a reliability coefficient of .69 while Marital Conflict Scale yielded a reliability coefficient of .70 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Adoga's study were simple percentage (for answering research questions) and spearman's correlational coefficient for hypotheses testing.

Adoga found that a strong positive correlation existed between depression and Marital Sex Related Conflict among highly experienced and less experienced parents of autistic children in Federal Capital Territory, Abuja. The relationship was same for highly experienced and less experienced parents in Adoga's study. Adoga's study was limited to depression and Marital Sex Related Conflict while this study extended its coverage to stigmatization and four other indices of marital conflict. Adoga was interested in experience of parents (highly experienced and less experienced) while this study was interested in gender of parents. Adoga answered research questions using simple percentage while Pearson's product moment correlation coefficient was used to answer research questions in this study. Adoga tested hypothesis with spearman's correlation coefficient while regression analyses was used for hypothesis testing in this study. Notwithstanding these differences, Adoga's study was useful to this present study in many ways; both studies treated same variables such as depression and Marital Sex Related Conflict. Both studies adopted similar research

design, and instrumentation. Consequently, Adoga's study cannot be neglected in a study such as this present one.

Sciz (2017) conducted a study on Marital Sex Related Conflict among stigmatized male and female parents with autistic children in Central Hong Kong. Design of the study was Ex-Post Facto. Five research questions and five hypotheses guided the study. Sample for the study was 280 parents with autistic children drawn using simple random sampling technique. Sciz collected data with a 32-item structured questionnaire, used mean with standard deviation to answer research questions and t-test for testing hypothesis.

Major findings of Sciz's study indicated a strong positive correlation between stigmatization and Marital Sex Related Conflict. The relationship was stronger with male parents than with their female counterparts. Sciz's study differed from this present work in choice of research design, statistical tools for data analyses, instrumentation and scope. Notwithstanding, Sciz's work relate with this study since stigmatization, Marital Sex Related Conflict and gender were variables in this study and Sciz's. As a result, Sciz's work aided inferences in this study.

Nwankwo (2019) investigated the predictive relationship between stigmatization and Sexual misunderstanding among couples with autistic children in Abia State. It was a causal comparative study guided by two research questions and two hypothesis. Using proportionate and simple random sampling techniques, Nwankwo drew a sample of 188 couples with autistic children from urban and rural areas in in Abia state. Nwankwo adopted readymade instruments, namely Stigmatization Identification Scale (SIC) and Marital Sex Related Conflict questionnaire (PRCQ) for data collection. Mean statistic was used to answer the research questions while t-test statistic was used to test hypothesis at 0.05 significant level.

Nwankwo reported that their existed a strong predictive relationship between parental stigmatization and Sexual misunderstanding among couples with autistic children in urban and rural areas of Abia state. The relationship was stronger among couples in rural areas than their counterparts in the urban areas. Nwankwo's study differed from this work in design, data analysis

and scope. Also, Nwankwo was interested in location of parents (urban/rural) while this study was interested in gender of parents. Both studies relate closely since parental stigmatization and Marital Sex Related Conflict were core variables in both studies. Thus, Nwankwo's study was relevant to this present work.

Abubakar (2018) in a study titled influence of stigmatization on Marital Conflict among parents of autistic children in Kaduna state: focus on sexual issues adopted correlational research design guided by three research questions and three hypotheses. Sample for the study was 322 parents of autistic children in Kaduna state. The sample was made up of 101 males and 221 females. Two instruments namely stigmatization questionnaire and Marital Conflict questionnaire were used for data collection in the study. The instruments were constructed by the researcher and validated by three research experts. Pearson product moment correlation coefficient was used to answer the research questions while hypothesis were tested using Multiple Regression Analyses.

In the major findings, Abubakar reported that stigmatization had a strong positive correlation with sexual issues among parents of autistic children in the area. The relationship was stronger with female parents than with their male counterparts. Abubakar treated only stigmatization, Marital Sex Related Conflict and gender while this study treated depression, stigmatization, parenting role conflict, marital verbal conflict, marital physical conflict, marital economic conflict, marital sex related conflict and gender. On the other hand, Abubakar adopted similar research design with that of this study. Also, Abubakar's study was consistent in this study in choice of statistical tools for testing hypotheses. In the same vein, all the variables in Abubakar's study constituted major components of this present study. Hence, both studies are related.

From the empirical studies reviewed above, majority of the researchers found strong predictive relationship among depression, stigmatization and marital conflict with respect to parents of autistic children. However, a few others found no significant predictive relationship among depression, stigmatization and marital conflict with respect to parents of autistic children. With regards to gender influence, many of the researchers found a significant influence,

more on females than males. Others found significant influence more on males than females. Whereas, a few others reported that gender had no significant influence on the topic of discourse. Hence, the gap of no definitive conclusion exists, justifying this present study.

CHAPTER 31

Topic:

PROBLEM-SOLVING ABILITIES AS DETERMINANTS OF SECONDARY SCHOOL STUDENTS' ACHIEVEMENT AND RETENTION IN ALGEBRA IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Jumoh (2017) conducted a study to determine the relationship between secondary school students' brainstorming ability and their achievement, interest and retention in mathematics in Delta state. The design used was survey design and was guided by four research questions and four hypotheses. The population for the study was 12,022 secondary school students in the area of the study from which a sample of 1550 was drawn using stratified, purposive and simple random sampling techniques. Instrument for data collection was Brainstorming Ability Scale (BAS). It was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .77 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Jumoh's study were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Jumoh found that students with high brainstorming ability achieved higher, showed better interest and retained more in mathematics than their counterparts with lower brainstorming ability. Rural school students with high brainstorming ability achieved higher, showed better interest and retained more than their urban schools' counterparts. Jumoh treated only brainstorming ability while this study treated four problem solving abilities. Jumoh covered mathematics as a whole for the class investigated while this study is interested in only algebra. Jumoh covered students' interest in mathematics as a variable while this study did not. However, Jumoh's study is useful to this present study in many ways; both

studies treated brainstorming ability, students' achievement and retention in mathematics as well as location of schools as variables. Both studies adopted similar research design, and tools for data analyses. Consequently, Jumoh's study cannot be neglected in a study such as this present one.

Irem (2018) conducted a study titled lateral thinking problem-solving ability as correlate of secondary school students' achievement, interest and retention in algebra in Afikpo Ebonyi state. Correlational research design was adopted in the study. Five research questions and five hypotheses guided the study. Sample for the study was 691 students drawn using simple random sampling technique. Three instruments were used for data collection in the study. One was Lateral Thinking Problem-solving Ability Scale another was Algebra Achievement Test and the other was Algebra Interest Scale. The instruments were constructed by the research and validated by five research experts. Mean, standard deviation and Pearson correlation were used for data analyses in the study.

In the major findings, Irem reported that students' lateral thinking problem-solving ability had high positive correlation with their interest, achievement and retention in algebra. Students in urban schools did better than their counterparts in rural schools. Irem treated only lateral thinking problem-solving ability while this study treated three more problem solving abilities. In addition to students' achievement and retention in algebra treated in this study, Irem treated students' interest in algebra. Unlike this study, Irem adopted correlational research design. Also, Irem differed from this study in choice of statistical tools for testing hypotheses. However, Irem's study is consistent with this study since all the variables of this present study were covered in Irem's. Hence, both studies are related.

Ebinibe (2017) conducted cross sectional study of gender difference in achievement and retention among secondary school students with different problem-solving abilities in Uyo, Akwa-Ibom state. Design of the study was descriptive survey. Four research questions and four hypotheses guided the study. Sample of the study was 406 secondary school students drawn using stratified and simple random sampling techniques. Out of the 406 students

studied, 186 were males while 220 were females. Ebinibe collected data with a structured questionnaire and used mean with standard deviation and t-test for data analyses.

Major findings of Ebinibe's study revealed that male and female students' achievement and retention in mathematics were not significantly determined by their problem-solving abilities. Ebinibe's study is related to this study as they adopted same research design and treated problem-solving abilities, students' achievement and retention in mathematics as variables. On the other, both studies differed in choice of statistical tools for data analyses. More so, Ebinibe was interested in gender while this study considered school location as variable. Notwithstanding, Ebinibe's work aided inference in this study.

Harry (2019) conducted a study titled problem-solving abilities as correlates of secondary school students' interest, achievement and retention in mathematics in Copenhagen. Correlational research design was adopted in the study. Five research questions and five hypotheses guided the study. Problem-solving abilities examined by Harry were lateral thinking, trial and error, brainstorming, divide and conquer and reduction. Sample for the study was 611 students drawn from a population of 21,893 in Copenhagen. Purposive stratified and simple random sampling techniques were used to draw the sample. Three instruments were used for data collection in the study. One was Problem-solving Ability Inventory another was Mathematics Interest Scale and the other was Mathematics Achievement Test. The instruments were constructed by the research and validated by five research experts. Mean and Spearman correlation coefficient were used for data analyses in the study.

In the major findings, Harry found that students' problem-solving abilities had high positive correlation with their interest, achievement and retention in mathematics. Students in urban schools fared better than their counterparts in rural schools. In addition to four problem solving abilities treated in this study, Harry treated a fifth one (trial and error abilities). In addition to students' achievement and retention in mathematics treated in this study, Harry treated students' interest in mathematics. Unlike this study,

Harry adopted correlational research design. Also, Harry differed from this study in choice of statistical tools for data analyses. Harry treated mathematics as a whole while this study concentrated on algebra. However, Harry's study is consistent with this study since all the variables of this present study were covered in Harry's. Hence, both studies are related.

Amadi (2019) conducted a study on effect of brainstorming problem-solving ability on junior secondary school students' interest in mathematics in Okigwe Education zone of Imo state. It was a quasi-experimental study, pretest-posttest, non-equivalent groups were used. A total of 592 JSSII students were sampled from six secondary schools in Okigwe Education zone of Imo state. The schools were made up of three rural and three urban schools drawn by purposive sampling while twelve intact classes were randomly sampled and assigned experimental and control groups. Mathematics Interest Scale (MIS) was used for data collection. The instrument was validated by three experts. A reliability coefficient of .77 was obtained for MIS using Cronbach's Alpha method. Two research questions and three hypotheses guided the study. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at 0.05 level of significance using Analyses of Covariance (ANCOVA).

Major findings of the study revealed that students with high brainstorming problem-solving ability showed more interest in mathematics than their counterparts with lower brainstorming problem-solving ability. Amadi further reported that urban and rural schools' students did not differ significantly in their interest in mathematics in the study. Amadi's study differed from this study in design, and data analyses. Amadi considered only students' interest in mathematics while this study considers students' achievement and retention. This study focused on algebra while Amadi treated more topics. Amadi treated only brainstorming while this study added three more problem solving abilities. On the other hand, Amadi treated brainstorming and school location which were also treated in this study. Hence, Amadi's study shall aid discussion of findings in this study.

Hilton (2020) conducted a study on effect of reduction problem-solving ability on high school students' achievement in mathematics in Kentucky Educational District, USA. It was a quasi-experimental study, pretest-posttest, non-equivalent groups were used. A total of 322 students were sampled from 14 high schools in Kentucky Educational District, USA. The schools were made up of five private and nine public schools drawn by proportionate and simple random sampling techniques. Mathematics Achievement Test (MAT) was used for data collection. The instrument was validated by the experts. A reliability coefficient of .69 was obtained for MAT using Kuder-Richardson's formula 20 (KR-20). Three research questions and three hypotheses guided the study. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at 0.05 level of significance using Analyses of Covariance (ANCOVA).

Major findings of the study revealed that students with high reduction problem-solving ability achieved higher in mathematics than their counterparts with lower reduction problem-solving ability. Also, public and private schools' students did not differ significantly in their achievement in mathematics in the study. Hilton's study differed from this study in design, and data analyses. Hilton considered only students' achievement in mathematics while this study considers students' achievement and retention. This study focused on algebra while Hilton treated more topics in mathematics. Hilton treated only reduction problem-solving ability while this study added three more problem solving abilities. Hilton treated school ownership as variable while this study treated school location. On the other hand, Hilton study is related to this study because reduction problem solving ability and students' achievement are components of this present study. Hence, Hilton's work shall aid inference in this study.

Alaje (2017) conducted a study to determine the relationship between secondary school students' lateral thinking ability and their achievement, interest and retention in algebra in Oyo state. The design used was survey design and was guided by four research questions and four hypotheses. The population for the study was 33,000 secondary school students in the area of the study from

which a sample of 1,550 was drawn using stratified, purposive and simple random sampling techniques. Instrument for data collection was Lateral Thinking Ability Scale (LAS). It was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .81 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Alaje's study were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Alaje found that students with high lateral thinking ability achieved higher, showed more interest and retained more in mathematics than their counterparts with lower lateral thinking ability. Rural school students with high lateral thinking ability achieved higher, showed more interest and retained more than their urban schools' counterparts. Alaje treated only lateral thinking ability while this study treats four problem solving abilities. Alaje covered students' interest in mathematics as a variable while this study did not. However, Alaje's study is useful to this present study in many ways; both studies treated lateral thinking problem-solving ability, students' achievement and retention in algebra as well as location of schools as variables. Both studies adopted similar research design, and tools for data analyses. Consequently, Alaje's study is very useful to this study.

Inusa (2018) conducted a study titled divide and conquer problem-solving ability as correlate of secondary school students' interest, achievement and retention in algebra in Zaria, Kaduna state. Correlational research design was adopted in the study. Four research questions and four hypotheses guided the study. Sample for the study was 321 students drawn using cluster and simple random sampling techniques. Three instruments were used for data collection in the study. One was Divide and Conquer Problem-solving Ability Scale another was Algebra Interest Scale and the other was Algebra Achievement Test. The instruments were constructed by the research and validated by three research experts. Mean, standard deviation and Pearson correlation were used for data analyses in the study.

In the major findings, Inusa reported that students' divide and conquer problem-solving ability had high positive correlation

with their interest, achievement and retention in algebra. Students in rural schools did better than their counterparts in urban schools. Inusa treated only divide and conquer problem solving ability while this study treated three more problem solving abilities. In addition to students' achievement and retention in algebra treated in this study, Inusa treated students' interest in algebra. Unlike this study, Inusa adopted correlational research design. Also, Inusa differed from this study in choice of statistical tools for testing hypotheses. However, Inusa's study is consistent with this study since all the variables of this present study were covered in Inusa's. Hence, both studies are related.

Marshal (2020) conducted a study to establish the relationship between high school students' divide and conquer ability and their achievement, interest and retention in mathematics in East London, UK. The design used was descriptive survey design and was guided by three research questions and three hypotheses. A sample of 1,204 high school students was drawn using stratified, purposive and simple random sampling techniques. Instrument for data collection was Divide and Conquer Ability Scale (DCAS). It was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .79 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Marshal's study were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Marshal found that students with high divide and conquer ability achieved higher, showed more interest and retained more in mathematics than their counterparts with lower divide and conquer ability. Public school students with high divide and conquer ability achieved higher, showed more interest and retained more than their private schools' counterparts. Marshal treated only divide and conquer ability while this study treats four problem solving abilities. Marshal covered mathematics as a whole while this study is interested in only algebra. Marshal covered students' interest in mathematics as a variable while this study did not. However, Marshal's study is useful to this present study in many ways; both studies treated divide and conquer ability and students' achievement and retention in as well as location of schools as variables. Both

studies adopted similar research design, and tools for data analyses. Hence, Marshal's study cannot be neglected in a study such as this present one.

Marua (2015) conducted a study titled problem-solving abilities as determinants of secondary school students' attitude, achievement and retention in mathematics in Gombe state. Correlational research design was adopted in the study. Five research questions and five hypotheses guided the study. Problem-solving abilities examined by Marua were divide and conquer, trial and error, lateral thinking, brainstorming and reduction. Sample for the study was 611 students drawn from area of the study. Cluster and simple random sampling techniques were used to draw the sample. Three instruments were used for data collection in the study. One was Problem-solving Ability Inventory another was Mathematics Attitude Scale and the other was Mathematics Achievement Test. The instruments were constructed by the research and validated by three research experts. Simple percentage and Spearman correlation coefficient were used for data analyses in the study.

In the major findings, Marua found that students' problem-solving abilities highly determined their attitude, achievement and retention in mathematics. Students in urban schools fared better than their counterparts in rural schools. In addition to four problem solving abilities treated in this study, Marua treated a fifth one (trial and error abilities). In addition to students' achievement and retention in mathematics treated in this study, Marua treated students' attitude in mathematics. Unlike this study, Marua adopted correlational research design. Also, Marua differed from this study in choice of statistical tools for data analyses. Marua treated mathematics as a whole while this study concentrated on algebra. However, Marua's study is consistent with this study since all the variables of this present study were covered in Marua's. Hence, both studies are related.

King (2015) conducted a study on gender differences in achievement and retention among high school students with different problem-solving abilities in Dundee, Scotland. Design of the study was descriptive survey. Four research questions and eight

hypotheses guided the study. Sample of the study was 406 high school students drawn using stratified and simple random sampling techniques. Out of the 216 students studied, 96 were males while 120 were females. King collected data with a structured questionnaire and used mean with standard deviation and chi-squared for data analyses.

Major findings of King's study revealed that male and female students' achievement and retention in mathematics were not significantly determined by their problem-solving abilities. King's study is related to this study as they adopted same research design and treated problem-solving abilities, students' achievement and retention in mathematics as variables. On the other hand, both studies differed in choice of statistical tools for data analyses. More so, King was interested in gender while this study considered school location as variable. Notwithstanding, King's work shall aid inference in this study.

Samuelson (2015) conducted a study to establish the relationship between high school students' lateral thinking problem-solving ability and their achievement, interest and retention in mathematics in Geneva Switzerland. The design used was descriptive survey design and was guided by two research questions and four hypotheses. A sample of 1,204 high school students was drawn using stratified, purposive and simple random sampling techniques. Instrument for data collection was Lateral Thinking Ability Scale (LAS). It was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .69 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Samuelson's study were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Samuelson found that students with high lateral thinking ability achieved higher, showed more interest and retained more in mathematics than their counterparts with lower lateral thinking ability. Public school students with high lateral thinking ability achieved higher, showed more interest and retained more than their private schools' counterparts. Samuelson treated only lateral thinking ability while this study treats four problem solving abilities.

Samuelson covered mathematics as a whole while this study is interested in only algebra. Samuelson covered students' interest in mathematics as a variable while this study did not. However, Samuelson's study is useful to this present study in many ways; both studies treated lateral thinking ability and students' achievement and retention in as well as location of schools as variables. Both studies adopted similar research design, and tools for data analyses. Hence, Samuelson's study cannot be neglected in a study such as this present one.

Preesha (2018) conducted a study to determine the relationship between secondary school students' reduction ability and their achievement, interest and retention in algebra in South West India. The design used was survey design and was guided by six research questions and six hypotheses. The population for the study was 13,000 secondary school students in the area of the study from which a sample of 2,250 was drawn using stratified, simple random sampling techniques. Instrument for data collection was Reduction Ability Scale (RAS). It was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .71 obtained through Cronbach's Alpha method. Statistical tools for data analyses in Preesha's study were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Preesha found that students with high reduction ability achieved higher, showed more interest and retained more in mathematics than their counterparts with lower reduction ability. Urban school students with high reduction ability achieved higher, showed more interest and retained more than their rural schools' counterparts. Preesha treated only reduction ability while this study treats four problem solving abilities. Preesha covered students' interest in mathematics as a variable while this study did not. However, Preesha's study is useful to this present study in many ways; both studies treated reduction problem-solving ability, students' achievement and retention in algebra as well as location of schools as variables. Both studies adopted similar research design, and tools for data analyses. Consequently, Preesha's study is very useful to this study.

Ditu (2019) conducted a study to determine the relationship between secondary school students' divide and conquer problem-solving ability and their achievement, interest and retention in mathematics in Central District of Zambia. The design used was survey design and was guided by four research questions and four hypotheses. The population for the study was 9,122 secondary school students in the area of the study from which a sample of 1,531 was drawn using purposive and simple random sampling techniques. Instrument for data collection was Divide and Conquer Ability Scale (DCAS). It was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .72 obtained through Cronbach's Alpha method. Statistical tools for data analyses were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Ditu found that students with high divide and conquer problem-solving ability did not differ significantly in their achievement, interest and retention in mathematics with their counterparts who had lower divide and conquer problem-solving ability. Also, urban and rural schools' students did not differ in their achievement, interest and retention in mathematics due to their divide and conquer problem-solving ability. Ditu covered mathematics as a whole while this study is interested in only algebra. Ditu treated only divide and conquer problem-solving ability while this study treats four problem solving abilities. However, Ditu study is useful to this present study in many ways; both studies treated divide and conquer problem-solving ability, students' achievement and retention in mathematics as well as location of schools as variables. Both studies adopted similar research design, and tools for data analyses. Consequently, Ditu's study cannot be neglected in a study such as this present one.

Viano (2019) conducted a study on effect of reduction problem-solving ability on secondary school students' interest in mathematics in Kenya. It was a quasi-experimental study, pretest-posttest, non-equivalent groups were used. A total of 295 students were drawn using purposive sampling. Mathematics Interest Scale (MIS) was used for data collection. The instrument was validated by three experts. A reliability coefficient of .87 was obtained for MIS

using Cronbach's Alpha method. Two research questions and three hypotheses guided the study. Mean and standard deviation were used to answer the research questions while the hypotheses were tested at 0.05 level of significance using Analyses of Covariance (ANCOVA).

Major findings of the study revealed that the students' interest in mathematics did not depend on their reduction problem solving ability. Viano further reported that urban and rural schools' students did not differ significantly in their interest in mathematics in the study. Viano's study differed from this study in design, and data analyses. Viano considered only students' interest in mathematics while this study considered students' achievement and retention. This study focused on algebra while Viano treated more topics. Viano treated only reduction problem-solving ability while this study added three more problem solving abilities. On the other hand, Viano treated reduction and school location which were also treated in this study. Hence, Viano's study shall aid discussion of findings in this study.

Yandev (2019) conducted a study titled brainstorming problem-solving ability as correlate of secondary school students' interest, achievement and retention in algebra in Gboko Benue state. Correlational research design was adopted in the study. Two research questions and four hypotheses guided the study. Sample for the study was 711 students drawn using cluster and simple random sampling techniques. Three instruments were used for data collection in the study. One was Brainstorming Problem-solving Ability Scale another was Algebra Interest Scale and the other was Algebra Achievement Test. The instruments were constructed by the research and validated by three research experts. Mean, standard deviation and Pearson correlation were used for data analyses in the study.

In the major findings, Yandev reported that students' brainstorming problem-solving ability had no significant correlation with their interest, achievement and retention in algebra. Likewise, school location (urban and rural) was not a significant factor in the study. Yandev treated only brainstorming problem-solving ability while this study treated three more problem solving abilities. In

addition to students' achievement and retention in algebra treated in this study, Yandev treated students' interest in algebra. Unlike this study, Yandev adopted correlational research design. Also, Yandev differed from this study in choice of statistical tools for testing hypotheses. However, Yandev's study is consistent with this study since all the variables of this present study were covered in Yandev's. Hence, both studies are related.

Gugi (2019) conducted a study to determine the relationship between secondary school students' lateral thinking problem-solving ability and their achievement, interest and retention in mathematics in South West Province of Ghana. The design used was survey design and was guided by four research questions and four hypotheses. The population for the study was 9,122 secondary school students in the area of the study from which a sample of 1,531 was drawn using purposive and simple random sampling techniques. Instrument for data collection was lateral thinking Ability Scale (LTAS). It was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .72 obtained through Cronbach's Alpha method. Statistical tools for data analyses were mean with standard deviation (for answering research questions) and z-test statistic for hypotheses testing.

Gugi found that students with high lateral thinking problem-solving ability did not differ significantly in their achievement, interest and retention in mathematics with their counterparts who had lower lateral thinking problem-solving ability. Also, urban and rural schools' students did not differ in their achievement, interest and retention in mathematics due to their lateral thinking problem-solving ability. Gugi covered mathematics as a whole while this study is interested in only algebra. Gugi treated only lateral thinking problem-solving ability while this study treats four problem solving abilities. However, Gugi study is useful to this present study in many ways; both studies treated lateral thinking problem-solving ability, students' achievement and retention in mathematics as well as location of schools as variables. Both studies adopted similar research design, and tools for data analyses. Consequently, Gugi's study cannot be neglected in a study such as this present one.

From the empirical studies reviewed above, some researchers found that the various problem-solving abilities facilitated students' achievement, interest and retention in mathematics. On the other hand, other researchers reported that those problem-solving abilities did not significantly influence the students' achievement, interest and retention in mathematics. Interestingly, none of the researchers found negative relationship between problem-solving abilities and students' achievement, interest and retention in mathematics. Hence, the gap of no definitive conclusion exists. Also, the results in the reviewed studies suggest a need to further verify if no negative relationship will still stand. These gaps justified this present study.

CHAPTER 32

Topic:

COUNSELING STRATEGIES ADOPTED BY SECONDARY SCHOOL PRINCIPALS FOR CONFLICT MANAGEMENT IN SECONDARY SCHOOLS IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Adoption of Allow the Client to Explore (ACE) Strategy for conflict management

Abiodun (2016) investigated the influence of Allow the Client to Explore (ACE) Strategy on principal's conflict management efficiency in Kachia Local Government Area of Kaduna state. Design of the study was descriptive design. Six research questions and six hypotheses guided the study. Population for the study was 145 public secondary school principals in Kachia Local Government Area of Kaduna state. A sample of 73 principals was drawn from the population and used for the study. Stratified and simple random sampling techniques were used to draw the sample. The sample was made up of 22 female and 51 male principals. Instrument for data collection was a questionnaire made up of 21-items. The questionnaire was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .77 obtained through Cronbach's Alpha method. Mean and standard deviation were used to answer the research questions while students' t-test statistic was used to test the hypotheses.

In major findings, Abiodun reported that ACE strategy enhanced principals' conflict management efficiency. Influence of ACE strategy was more on male principals than their female counterparts. Hence, male principals adopted ACE strategy more than their female counterparts. Abiodun adopted same design as in this study. Also Abiodun used same statistical tools to answer research questions. However, Abiodun used t-test to test hypotheses

while ANOVA shall be used in this study. Abiodun studied only ACE strategy but this study covers six strategies. Abiodun investigated influence of gender but this study is interested in influence of gender and location. Notwithstanding, Abiodun's work is very useful to this study.

Lee and Phyla (2017) conducted a study on effectiveness of Allow the Client to Explore (ACE) Counseling Strategy for conflict management in Hung Kong colleges. A survey research design was employed in the study. A sample of 145 respondents was drawn from the population for the study. four research questions and four hypotheses were posed for the study. Instrument for data collection was a questionnaire containing eleven (11) close-ended and two (2) open-ended items. Pearson correlation was used for testing the hypotheses and research questions answered using mean and standard deviation. Results revealed that ACE strategy was found to be ineffective for conflict management in the area of the study. Hence, it was not well adopted by the college Heads sampled in the study.

The ineffectiveness and consequent low adoption of ACE strategy was same for the male and female college Heads in both Urban and rural locations. The above study is similar to this present one in that both have to do with counseling strategies. Both study adopted the same research design and instrumentation. Also both studies were interested on the influence of gender and location. But, the present study differs from the study of Lee and Phyla in method of data analyses. Also more Counseling strategies are covered in this study. Yet, the work of Lee and Phyla is very relevant to this study. Lankey (2017) investigated the influence of Allow the Client to Explore (ACE) Strategy on principal's conflict management efficiency in Ontario, Canada. Design of the study was descriptive research design. five research questions and five hypotheses guided the study. Population for the study was 312 high school principals in Ontario, Canada. A sample of 105 principals was drawn from the population and used for the study. Stratified and simple random sampling techniques were used to draw the sample. The sample was made up of 61 female and 54 male principals. Instrument for data collection was a questionnaire made up of 30-items. The

questionnaire was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .83 obtained through Cronbach's Alpha method. Mean and standard deviation were used to answer the research questions while Chi-squared (x^2) statistic was used to test the hypotheses.

Lankey reported that ACE strategy enhanced principals' conflict management efficiency. Influence of ACE strategy was more on female principals than their male counterparts. Hence, fenale principals adopted ACE strategy more than their male counterparts. Lankey adopted same design as in this study. Also Lankey used same statistical tools to answer research questions. However, Lankey used Chi-squared (x^2) to test hypotheses while ANOVA shall be used in this study. Lankey studied only ACE strategy but this study covers six strategies. Lankey investigated influence of gender but this study is interested in influence of gender and location. Yet, Lankey's work is very useful to this study.

Adoption of Using Silences in the Relationship (USR) Strategy for conflict management

Akan (2014) conducted a study on principals adoption of Using Silences in the Relationship Strategy in Secondary Schools in Akoko-Edo, Ondo state". Descriptive survey was adopted for the study. The sample of the study was composed of 55 participants purposively selected. The study was guided by 2 research questions and a hypothesis. 25-item structured questionnaire was used to collect relevant data for the study. Percentages were used to answer research questions and hypotheses tested using chi-square statistics. Among the findings of the study was that the principals adopted Using Silences in the Relationship (USR) strategy to a very low extent. However urban schools' principals adopted USR strategy more than their rural counterpart. This study and Akan's are related at the level of research design. Both studies used survey research design. Location is equally a factor in the two studies. However, the studies differed on the level of data analyses tools where Akan used percentage and chi-squared while this study shall use mean, standard deviation and ANOVA. Unlike this study, Akan did not study gender. These constitute the gaps that this study intends to fill.

Also on USR strategy, Tsui (2016), in a descriptive survey guided by three research questions and three hypotheses sought to examine the impact of Using Silences in the Relationship Strategy in Indian high schools. Simple random sampling and proportionate sample techniques were combined in drawing a sample of 486 high school principals. 200 of the principals were drawn from rural high school while 286 were drawn from urban high school. Also 350 of the principals where males while 136 where females. An 18-item structured questionnaire was used for data collection. The questionnaire was validated and had a reliability coefficient of 0.87. Simple percentage was used to answer the research questions. Two-way ANOVA was used for testing the hypotheses.

Major findings of the study revealed that using silences in the relationship as counseling strategy was very effective in school management. rural schools' principals adopted USR strategy more than their urban schools' counterparts. But male and female principals did not differ significantly in their extent of adoption of USR strategy. Tsui adopted the same research design with this study but did not cover all the indices of counseling strategies covered in this present study. Tsui used different statistical tools (simple percentage) for answering research questions but the same ANOVA as this study for testing hypotheses. Tsui was concerned with one strategy only (USR) while this study covered six strategies. yet Tsui's study is very much useful to this study. The aspect of counseling strategy (using silence in the relationship strategy) covered by Tsui is a component of this study, thus, they are very much related.

In another Asian country, Singapore, Bordin (2016) undertook a study on impact of Using Silences in the Relationship Strategy on principals' administrative competencies. Descriptive survey was adopted for the study. The sample of the study was composed of 100 participants purposively selected. The study was guided by three research questions and six hypotheses. 35-item structured questionnaire was used to collect relevant data for the study. Percentages were used to answer research questions and hypotheses testing was done using chi-squared statistic. Among the findings of the study was that Using Silences in the Relationship

Strategy impacted positively on principals' administrative competencies. Male principals were influenced more than their female counterparts. Bordin studied only one strategy and was interested in gender only. This study studies five strategies and is interested in both gender and location. Bordin answered research questions with percentages and tested hypothesis with chi-square but in this study, research question shall be answered with mean and standard deviation and hypothesis shall be tested with ANOVA. On the other hand, both studies are related in choice of design and instrumentation. Thus, Borden's study is very useful to this present study.

Adoption of Paraphrasing Strategy for conflict management

In a descriptive survey, Modo (2013) focused on Effect of Paraphrasing Strategy on principals' managerial effectiveness in Akwa-Ibom state. The population comprised of all principals in public secondary schools in Uyo municipality, Uyo local government area of Akwa-Ibom state. A sample size of 87 principals responded to the instruments. Three research questions and three null hypotheses were raised and tested for the study. Data were collected using a researcher made questionnaire. The data were analyzed at 0.05 alpha level using mean for research questions and t-test for hypotheses. After computation, the result revealed that paraphrasing strategy did not make significant effect on principals' managerial effectiveness in Uyo municipal. The insignificant effect was same for male and female principals in urban and rural schools. Modo answered research questions with only mean statistic while this study shall use mean and standard deviation. Modo tested hypotheses with t-test while this study shall use ANOVA. Modo treated only paraphrasing strategy while this study treats six strategies. Modo used the same design and instrumentation as this study. Despite few differences between Modo's study and this present work, both studies also have similarities in design and variables treated. Thus, Modo's study shall be of great help in drawing inferences in this present study.

Omotere (2014) conducted a research on extent of adoption of Paraphrasing Strategy in selected secondary schools in Ogun

State. Descriptive research methodology was used. It was guided by seven research questions and seven hypotheses. Simple Random sampling techniques was also adopted in selecting 150 school principals in Ogun State. Questionnaire was developed to collect data. The data collected was analyzed using t-test and Pearson correlation. The findings of the study revealed that paraphrasing counseling strategy was adopted by the principals to a very great extent. Urban schools' principals adopted it more than rural school principals. Male principals also adopted it more than female principals. Omotere's study shall be useful in discussion of findings in this study where relevant comparisons shall be made irrespective of the differences of his study and this present one. Omotere's study addressed secondary schools just as this study. Also both studies focused on counseling strategies, used same research design, same instrument for data collection and addressed the same gap. Both studies differ in data collection, data analyses and choice of number of variable. yet, Omotere's study is closely related to this study.

In a descriptive survey, Ikechi (2016), investigated the influence of Paraphrasing Strategy on Secondary School administrators in Abia state. Descriptive survey research design was adopted. Ikechi posed five research questions and formulated five hypotheses. The population comprised of all administrators in all public secondary schools in Abia state. A sample size of 126 administrators responded to the instrument (18 item questionnaire). The data were analyzed at 0.05 alpha level using mean and standard deviation for research questions and t-test for hypothesis. The result revealed that paraphrasing strategy improved the administrator's decision making and team work significantly. Female administrators utilized the strategy more than their male counterpart. Ikechi's study is related to this present study in design, instrumentation and tools for answering research questions. The two studies differ in test of hypothesis. Ikechi focused only on paraphrasing strategy and gender while this study treats five more strategies in addition to gender and location. However, Ikechi's work will be very useful to this researcher.

Adoption of Using REBT Challenges (URC) Strategy for conflict management

Gatua (2015) investigated the influence of using Rational Emotive Behavior Therapy (REBT) Challenges Strategy on principal's conflict resolution ability in Rift Valley province Kenya. Design of the study was descriptive design. four research questions and four hypotheses guided the study. Population for the study was 199 public secondary school principals in Rift Valley province Kenya. A sample of 64 principals was drawn from the population and used for the study. Stratified and simple random sampling techniques were used to draw the sample. The sample was made up of 30 female and 34 male principals. Instrument for data collection was a questionnaire made up of 18-items. The questionnaire was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .85 obtained through Cronbach's Alpha method. Mean and standard deviation were used to answer the research questions while students' t-test statistic was used to test the hypotheses.

In major findings, Gatua reported that REBT strategy enhanced principals' conflict resolution ability. Influence of REBT strategy was more on female principals than their male counterparts. Hence, female principals adopted REBT strategy more than their male counterparts. Gatua adopted same design as in this study. Also Gatua used same statistical tools to answer research questions. However, Gatua used t-test to test hypotheses while ANOVA shall be used in this study. Gatua studied only REBT strategy but this study covers six strategies. Gatua investigated influence of gender but this study is interested in influence of gender and location. Notwithstanding, Gatua's work is very useful to this study.

Uchendu (2013) conducted a study on efficiency of REBT Counseling Strategy for conflict management in Anambra State secondary schools. A survey research design was employed in the study. A sample of 99 respondents was drawn from the population for the study. four research questions and four hypotheses were posed for the study. Instrument for data collection was a questionnaire containing 25-items. Pearson correlation was used for testing the hypotheses and research questions answered using mean

and standard deviation. Results revealed that REBT strategy was found to be ineffective for conflict management in the area of the study. Hence, it was not well adopted by the secondary school principals sampled in the study. The ineffectiveness and consequent low adoption of REBT strategy was same for the male and female secondary school principals in both Urban and rural locations. The above study is similar to this present one in that both have to do with counseling strategies. Both study adopted the same research design and instrumentation. Also both studies were interested on the influence of gender and location. But, the present study differs from the study of Uchendu in method of data analyses. Also more Counseling strategies are covered in this study. Yet, the work of Uchendu is very relevant to this study.

Nuhu (2016) investigated the influence of using Rational Emotive Behavior Therapy (REBT) Challenges Strategy principal's conflict management efficiency in Kogi Southern region. Design of the study was descriptive research design. five research questions and five hypotheses guided the study. Population for the study was 105 secondary school principals in Kogi Southern region. A sample of 66 principals was drawn from the population and used for the study. Stratified and simple random sampling techniques were used to draw the sample. The sample was made up of 39 female and 27 male principals. Instrument for data collection was a questionnaire made up of 28-items. The questionnaire was constructed by the researcher and validated by three research experts. It yielded a reliability coefficient of .67 obtained through Cronbach's Alpha method. Mean and standard deviation were used to answer the research questions while Chi-squared (x^2) statistic was used to test the hypotheses.

Nuhu reported that REBT strategy enhanced principals' conflict management efficiency. Influence of REBT strategy was more on male principals than their female counterparts. Hence, male principals adopted REBT strategy more than their female counterparts. Nuhu adopted same design as in this study. Also Nuhu used same statistical tools to answer research questions. However, Nuhu used Chi-squared (x^2) to test hypotheses while ANOVA shall be used in this study. Nuhu studied only REBT strategy but this

study covers six strategies. Nuhu investigated influence of gender but this study is interested in influence of gender and location. Yet, Nuhu's work is very useful to this study.

In California, USA, Karl (2016) conducted a study aimed at finding-out the effectiveness of REBT Counseling Strategy for conflict management in High school. Descriptive research design of the survey type was used. Two research questions and two hypotheses guided the study. 315 respondents were selected for the study through stratified random sampling technique. A questionnaire constructed by the researcher and vetted by experts was used as instrument for data collection. The questionnaire had 18 times scored on a four-point scale. Mean, standard deviation and Chi-square statistics was used for data analysis. Findings of the study showed that REBT Counseling Strategy was ineffective for conflict management. The ineffectiveness was same for urban and rural schools as well as for male and female principals. Hence, no significant difference. Karl's study deviated from this study in the choice of tools for data analysis. Specifically, in testing hypothesis, Karl used Chi-square while this study will use ANOVA. Karl studies only REBT Counseling strategy while this study studies 5 strategies. However, both studies are related in studying both gender and location. The two studies also are related in the choice of descriptive survey research design. Consequently, the two studies are relevant to each other.

Adoption of Using Positive Verbal Encouragements (UPE) Strategy for conflict management

Smith (2016) investigated the Adoption of Using Positive Verbal Encouragements (UPE) Strategy for conflict Resolution in New Jersey, USA. Descriptive survey research design was used for the study. It was guided by three research questions and three hypotheses. A total of 400 secondary school administrators was drawn using multi-stage sampling technique. A structured questionnaire vetted by research experts was used as instrument for data collection. The questionnaire had 20 valid items. Research questions were answered with simple percentage while t-test statistics was used for hypotheses' testing. The study revealed that

the administrators adopted UPE strategy to a Great Extent. Male and female administrators did not differ significantly in their adoption of UPE strategy for conflict resolution. But rural schools' administrators adopted it more than their urban schools' counterparts.

Smith's study differed from this present study in choice of statistical tools for data analysis. Also smith studied only UPE strategy unlike this study that treats six strategies. On the other hand, smith's variables such as UPE strategy, gender and location are all part of this study. Smith's research design and instrumentation are similar to those adopted for this study. Consequently, Smith's study shall be of great help in drawing inferences in this present study.

Also on UPE strategy, El-Amin (2012), in a descriptive survey guided by three research questions and three hypotheses sought to examine the Effect of Using Positive Verbal Encouragement Counseling Strategy in Uganda high schools. Simple random sampling and proportionate sample techniques were combined in drawing a sample of 182 high school principals. 80 of the principals were drawn from rural high school while 102 were drawn from urban high school. Also 115 of the principals where males while 67 where females. A 30-item structured questionnaire was used for data collection. The questionnaire was validated and had a reliability coefficient of 0.87. Simple percentage was used to answer the research questions. Two-way ANOVA was used for testing the hypotheses.

Major findings of the study revealed that using UPE strategy was very effective in conflict management. Urban schools' principals adopted UPE strategy more than their rural schools' counterparts. Also male principals adopted the strategy more than the female principals. El-Amin adopted the same research design with this study but did not cover all the six counseling strategies covered in this present study. El-Amin used different statistical tools (simple percentage) for answering research questions but the same ANOVA as this study for testing hypotheses. Yet, El-Amin's study is very much useful to this study. The aspect of counseling strategy (UPE strategy) covered by El-Amin is a component of this study, thus, they are very much related.

In Singapore, Nezera (2017) conducted a study aimed at finding-out level of adoption of Positive Verbal Encouragements (UPE) Strategy for conflict management in secondary school. Descriptive research design of the survey type was used. Three research questions and three hypotheses guided the study. A total of 212 respondents were selected for the study through stratified random sampling technique. A questionnaire constructed by the researcher and vetted by experts in measurement and evaluation as well as experts in guidance and Counseling was used as instrument for data collection. The questionnaire had 31 times scored on a four-point scale. Mean and Chi-square statistics was used for data analysis.

Findings of the study showed that UPE Strategy was not well adopted for conflict management in the area of study. However, female principals adopted it more than their male counterparts. Nezera's study deviated from this study in the choice of tools for data analysis. Specifically, Nezera used Chi-square while this study used ANOVA for hypotheses testing. Nezera studied only UPE strategy while this study studied 5 strategies. Nezera was interested in only Gender while this study considered gender and location as variables. However, both studies are related in the choice of descriptive survey research design. Consequently, the two studies are useful to each other.

Adoption of Directive Counseling (DC) Strategy for conflict management

In a descriptive survey, Okeke (2018) focused on Effect of Directive Counseling Strategy on principals' managerial effectiveness in Abia state Nigeria. The population comprised of all principals in public secondary schools in Abia state Nigeria. A sample size of 87 principals responded to the instruments. Five research questions and Five null hypotheses were raised and tested for the study. Data were collected using a researcher made questionnaire. The data were analyzed at 0.05 alpha level using mean for research questions and t-test for hypotheses. After computation, the result revealed that Directive Counseling strategy did not make significant effect on principals' managerial

effectiveness in Abia state Nigeria. The insignificant effect was same for male and female principals in urban and rural schools. Okeke answered research questions with only mean statistic while this study shall use mean and standard deviation. Okeke tested hypotheses with t-test while this study shall use ANOVA. Okeke treated only paraphrasing strategy while this study treats six strategies. Okeke used the same design and instrumentation as this study. Despite few differences between Okeke's study and this present work, both studies also have similarities in design and variables treated. Thus, Okeke's study shall be of great help in drawing inferences in this present study.

Awofes (2016) conducted a research on influence of Directive Counseling Strategy in selected secondary schools in Benue state. Descriptive research methodology was used. It was guided by seven research questions and seven hypotheses. Simple Random sampling techniques was also adopted in selecting 150 school principals in Ogun State. Questionnaire was developed to collect data. The data collected was analyzed using t-test and Pearson correlation.

The findings of the study revealed that Directive Counseling strategy was adopted by the principals to a very great extent. Urban schools' principals adopted it more than rural school principals. Male principals also adopted it more than female principals. Awofes's study shall be useful in discussion of findings in this study where relevant comparisons shall be made irrespective of the differences of his study and this present one. Awofes's study addressed secondary schools just as this study. Also both studies focused on counseling strategies, used same research design, same instrument for data collection and addressed the same gap. Both studies differ in data collection, data analyses and choice of number of variable. yet, Awofes's study is closely related to this study.

Udoh (2012) undertook a study to establish the Impact of directive Counseling strategy for conflict management in Akwa-Ibom state secondary schools. Udoh adopted causal comparative research design. Simple random stratified and purposive sampling techniques were used to draw 85 principals from the target population. four research questions and four hypotheses guided the

study. A 16 item questionnaire was used to collect data. The questionnaire was validated by 3 research experts. It yielded a reliability coefficient of .74 obtained using Cronbach's Alpha Method. Udoh used mean and standard deviation to answer the research questions. one-way analysis of variance (ANOVA) was used to test the hypothesis at 0.05 level of significance.

Udoh reported that directive Counseling Strategy had statistically positive impact in conflict management. The impact was more for rural schools than their urban counterparts. Udoh study deviated from this study in the choice of design and number of variables. In Specific terms, Udoh adopted causal comparative research design while this study adopts descriptive survey. Udoh studied only directive Counseling strategy with location while this study studied 6 strategies in addition to location and gender as variables. However, both studies are related in the choice of tools for data analyses. Hence, the similarities of the two studies make them relevant to each other.

Kitz (2018) undertook a study to establish the Impact of directive Counseling strategy for conflict management in central Chinese high schools. Kitz adopted causal comparative research design. Simple random and purposive sampling techniques were used to draw 135 high school heads from the target population. four research questions and four hypotheses guided the study. A 20 item questionnaire was used to collect data. The questionnaire was validated by 3 research experts. It yielded a reliability coefficient of .68 obtained using Cronbach's Alpha Method. Kitz used mean and standard deviation to answer the research questions. Analysis of variance (ANOVA) was used to test the hypothesis at 0.05 level of significance.

Kitz reported that directive counseling Strategy had no significant impact in conflict management. Hence, the principals adopted it to a low extent. Nevertheless, female principals adopted it more than their male counterparts. Kitz study is closely related to this study. Both studied Directive Counseling and gender influence. Both use same tools for data analyses. But Kitz differed in choice of research design. Also this study covered six counseling strategies

and influence of school location. However, Kitz's study guided discussions and inference in this present study.

From the review of empirical studies presented above it is evident that there is no definitive conclusion on adoption of Counseling strategies for conflict management in secondary schools. While some studies found Counseling strategies to be effective others found the strategies to be ineffective for conflict management. In the same vein, some researchers found male principals adopting Counseling strategies for conflict management more than their female counterpart. Whereas some other researchers found female principals adopting Counseling strategies for conflict management more than their male counterpart. The same conflicting findings were also reported for school location. Some researchers found adoption of Counseling strategies more in urban schools than the rural schools. Others reported that adoption of Counseling strategies was more in rural schools than the urban schools. Form the fore goings, there is need for another study such as this present one.

CHAPTER 33

Topic:

TEACHERS' PERCEPTION OF SOCIAL DEVELOPMENT SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED PERFORMANCE IN MATHEMATICS IN ENUGU STATE

Here are reviews of some empirical works related to this topic

Studies on Goal Orientation Skills

Cherry (2015) conducted a descriptive survey in Northern Ireland, United Kingdom to investigate the relevance of goal orientation skills in improving students' performance in mathematics. 3,116 high school students were drawn from 32 high schools and used as sample for the study. Technique used was simple random sampling. Four research questions and four hypotheses guided the study. Instrument used for data collection was a 22-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while regression analysis was used for hypotheses testing. Cherry reported that goal orientation skills were very relevant in improving the performance of high school students in mathematics in Northern Ireland. The performance of female students was reported to have been influenced more than those of their male counterparts. Cherry's study is closely related to this study in so many ways. Foremost, both studies treat the same variables (goal orientation skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this present study addressed other social development indices unlike Cherry's work that focused only on goal orientation skills. Also, Cherry tested hypotheses with regression analysis while this study used z-test statistic. More-so, respondents in Cherry's study were students while teachers were used as respondents in this study.

Notwithstanding, Cherry's study and findings aided inferences in this study.

Babalola (2016) conducted a descriptive survey aimed at discovering the importance of goal orientation skills in improving students' performance in mathematics in Abiokuta, Ogun state. 472 secondary school students were drawn from 12 secondary schools in Abiokuta and used as sample for the study. Technique used was simple random sampling. two research questions and two hypotheses guided the study. Instrument used for data collection was a 16-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while t-test was used for hypotheses testing. In major findings, Babalola reported that goal orientation skills were very important in improving the performance of secondary school students in mathematics. Performance of the students were influenced equally, hence, no significant difference between male and female students. Babalola's study is closely related to this present study in so many ways. Foremost, both studies treated the same variables (goal orientation skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this present study addressed other social development indices unlike Babalola's work that focused only on goal orientation skills. Also, Babalola tested hypotheses with t-test while this study used z-test statistic. More-so, respondents in Babalola's study were students while teachers were used as respondents in this study. Despite these differences, Babalola's findings supported inferences in this study.

Zico (2015) investigated the impact of goal orientation skills on students' performance in mathematics in selected Switzerland colleges. Zico adopted a descriptive survey design. Six research questions and six hypotheses guided the study. A 25-item structured questionnaire was used for data collection. The questionnaire was validated by three research experts and had a reliability coefficient of 0.62. It was scored on a five-point scale. Mean, standard deviation and chi-square were used for data analyses. In the major findings, Zico reported that the goal orientation skills of the sampled students did not make any significant impact on their academic performance.

The situation was same for public and private schools students. Zico's study is consistent with this study though Zico compared influence of goal orientation skills on public school students with those of private schools while this study is interested in gender. Zico used chi-square to test hypotheses but this study used z-test statistic. Zico treated only goal orientation skills while this study treated four more indices of social development. Also, Zico focused on general academic performance while this study focused on performance in mathematics. However, Zico's study was very useful to this study, especially in interpretation of results.

Dickson (2016) attempted to determine teachers' perception of social development skills needed by high school students for learning mathematics in Ohio, United States of America. Descriptive survey was adopted as design of the study. Six research questions and six hypotheses guided the study. A sample of 268 teachers was drawn from 136 high schools in Ohio, United States of America. The sample consisted of 81 teachers from female high schools and 187 from male high schools. Proportionate and simple random sampling techniques were used to draw the sample. A 30-item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher. It was graded using a 4-point scale. Mean was used to answer all the research questions. Hypotheses were tested at 0.05 level of significance using Analysis of Variance (ANOVA).

Major findings of Dickson's study revealed that the social development skills needed by the students as perceived by their teachers included; goal orientation, relationship, decision-making, sense of belonging and tolerance skills. Female high school teachers perceived the need for these indices more than their male counterparts. Dickson's study and this present work are very closely related. Both studies treated the same variables (social development skills and gender), adopted same design, used similar respondents and scored their responses same way. On the other hand, they differ in data analyses. Dickson answered research questions with mean only, but this study used mean and standard deviation. Dickson tested hypotheses with ANOVA but this study used z-test statistic. Interestingly, the five indices of social development perceived to be

important by Dickson's respondents were the same indices that formed the crux of this present study. Thus, Dickson's study was very useful in discussing findings of this present study, where useful comparisons were made.

In the same American continent, Zippoh (2016) conducted a descriptive survey aimed at ascertaining teacher's perception of influence of goal orientation skills on students' performance in Onterio, Canada. 10 research questions and 15 hypotheses guided the study. An on-line questionnaire made up of 114 items, scored on a 5-point scale was used for data collection. Responses were collected on-line from 1500 teachers. Mean and standard deviation were used to answer the research questions while Analysis of Variance (ANOVA) was used to test the hypotheses at 0.05 significant level. Zippoh reported that teachers perceived a very high positive influence of goal orientation skills on students' performance. Also, male teachers were reported to have perceived a higher need for goal orientations skills than their female counterparts. A major limitation of Zippoh's work was certifying the true identity of the subjects, that is, the respondents. This was because responses were collected on-line and the chances of non-teachers responding to the instrument were high. Zippoh's work is consistent with this present study. Both studies addressed goal orientation skills, academic performance and influence of gender. Both studies used teachers as respondents. However, this study covered more variables with respect to number of social development skills addressed. Both studies also differed slightly in the choice of tools for data analyses with respect to hypotheses' testing. The on-line questionnaire limitation in Zippoh's study was corrected in this study where data collection was done physically, hence, ensuring that only appropriate persons responded to the questionnaire.

Studies on Decision-Making Skills

On decision making skills, Tsui (2016) in a descriptive survey guided by three research questions and three hypotheses sought to examine the extent of students' decision-making skills influence on their academic performance in selected Indian colleges.

Simple random sampling and proportionate sample techniques were combined in drawing a sample of 386 students. 200 of the students were drawn from rural colleges while 268 were drawn from colleges in urban locations. An 18-item structured questionnaire was used for data collection. The questionnaire was validated by experts and it had a reliability coefficient of 0.87. Simple percentage was used to answer the research questions. Two-way ANOVA was used for testing the hypotheses. Major findings of the study revealed that the students' decision-making skills did not significantly influence their performance in mathematics. Urban schools' students were influenced more than their rural schools' counterparts. Tsui did not cover all the indices of social development skills covered in this present study. Tsui used different statistical tools for data analyses from the ones used in this study. Tsui was concerned with school location whereas this study was concerned with gender, yet Tsui's study is very useful to this study. The aspect of social development (decision making skill) covered by Tsui is a component of this study, thus, both studies are very much related.

In another Asian country, Lee (2016) undertook a study to determine the need for decision-making skills among secondary school students in Central Singapore. The design for the study was a combination of expo-facto and a descriptive survey. Six research questions and eight hypotheses guided the study. A 15-item checklist was used to collect data. A sample of 5000 students was drawn for the study. To do this, purposive sampling technique was used. Out of the 5000 students, 2800 were females and 2200 were males. Mean and standard deviation were used to answer the research questions while hypotheses were tested with Analysis of Variance (ANOVA) at 0.05 level of significance. Lee reported that decision making skills were highly needed by the students. Male students cherished the skills more than their female counterparts. Lee's study differed from this present study in choice of design where Lee combined Expo-facto and survey but this study adopted only survey design. Instruments for data collection in Lee's study was Checklist while questionnaire was used in this study. Lee also differed in statistical tool for data analyses. Lee used students as respondents while teachers were used as respondents in this present

study. However, Lee's study and this present study relate very well in some aspects. Decision making skill covered in Lee's work is part of this study. More-so, Lee considered gender influence as done in this study. Therefore, Lee's study aided conclusions that were made in this study.

Stone (2016) sought to determine teachers' perception of social development skills needed by high school students for learning mathematics in Cape-Town, South Africa. Descriptive survey was adopted as design of the study. Two research questions and two hypotheses guided the study. A sample of 228 teachers was drawn from 84 high schools in Cape-Town, South Africa. The sample consisted of 87 female teachers and 141 male teachers. Proportionate and simple random sampling techniques were used to draw the sample. A 25-item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher. It was graded using a 4-point scale. Mean and standard deviation was used to answer all the research questions. Hypotheses were tested at 0.05 level of significance using z-test statistic.

Major findings of Stone's study revealed that the social development skills needed by the students as perceived by their teachers included; decision-making, goal orientation, relationship, team work and cohabitation skills. Female high school teachers perceived the need for these indices more than their male counterparts. Stone's study and this present work are very closely related. Both studies treated the same variables (social development skills and gender), adopted same design, used similar respondents and scored their responses same way. Also, both studies used same tools for data analyses. Moreso, three out of the five indices of social development perceived to be important by Stone's respondents are among the indices treated in this study. Thus, Stone's study was very useful in discussing findings of this study where useful comparison was made.

Amawo (2017) conducted a descriptive survey with the aim of establishing the importance of decision-making skills in improving students' performance in mathematics in Obudu, Cross River state. 312 secondary school students drawn from 9 secondary schools in Obudu was used as sample for the study. Amowo used

simple random sampling techniques to draw the sample. three research questions and three hypotheses guided the study. Instrument used for data collection was a questionnaire made up of 20-item and graded on a 4-point scale. Research questions were answered with mean and standard deviation while chi-squared was used for hypotheses testing. Amawo reported in key findings that decision-making skills were very important in improving the performance of secondary school students in mathematics. Performance of the male and female were influenced equally. Amawo's study is closely related to this present study in so many ways. First, both studies treated the same variables (decision-making skills and influence of gender). Moreso, both studies adopted same design and same statistical tools for answering research questions. On the other hand, this present study addressed four other social development indices in addition to dicision making treated by Amawo. Also, Amawo tested hypotheses with chi-squared while this study used z-test statistic. More-so, respondents in Amawo's study were students while teachers were used as respondents in this study. Notwithstanding these differences, Amawo's findings guided inferences in this study.

Studies on Sense of Belonging Skills

In a descriptive survey, Jida (2017) worked on need for enhancing secondary school students' mathematics performance through sense of belonging skills in Nairobi Kenya. Four research questions and four hypotheses guided the study. A structured questionnaire made up of 24 items, scored on a 4-point scale was used for data collection. Questionnaire copies were distributed to respondents directly and collected back same way. A sample of 60 teachers was drawn by stratified simple random sampling techniques and used for the study. Data collected were analyzed using mean and z-test statistics. Mean was used to answer the research questions while z-test statistics was used to test the hypotheses at 0.05 level of significance. According to Jida, findings of the study showed that sense of belonging skills were highly needed for enhancing secondary school students' performance in mathematics in Nairobi, Kenya. Male and female teachers did not

differ significantly in their perceptions in Jida's study. This present study is wider in scope as it treated other indices of social development unlike Jida's study which was concerned only with sense of belonging skills. Jida used only mean to answer research questions whereas this study used mean and standard deviation to answer research questions. Yet, Jida's study is very consistent with this study and was very useful in drawing rational conclusions as both studies treated sense of belonging skills and gender influence as variables.

Yancho (2016) conducted an ex-post facto study to investigate impact of sense of belonging skills on students' performance in core sciences in North Eastern District of Namibia. Three research questions and three hypotheses guided the study. A sample of 1,280 secondary school students was drawn. Purposive random sampling techniques was used to draw the sample. The sample consisted 580 male students and 700 female students. A 23-item structured questionnaire was used for data collection. The instrument was constructed by the researcher, validated by three research experts and had a reliability coefficient of 0.71. Mean and standard deviation were used to answer research questions while test of hypotheses was done using chi-square at .05 significant level. In the major findings, Yancho reported that sense of belonging skills of the sampled students made significant impact in their performances in core sciences. The impact was higher on male students than their female counterparts. Yancho used chi-square to test hypotheses but this study used z-test statistic. Yancho adopted Expo facto design while this study adopted descriptive survey. Yancho treated only sense of belonging skills while this study treated four more indices of social development skills in addition to sense of belonging skills. Yancho was interested in core sciences but this study focused on mathematics. However, Yancho's study and this present one treated same variables (sense of belonging skills and gender influence) and answered research questions with the same tools (mean and standard deviation). Consequently, Yancho's study was very useful to this study, especially in interpretation of results.

Kyap (2019) conducted a descriptive survey in Mid-west Rwanda to ascertain the usefulness of sense of belonging skills for

improving students' performance in mathematics. 316 students were drawn from 40 secondary schools and used as sample for the study. Technique used was simple random sampling. Five research questions and five hypotheses guided the study. Instrument used for data collection was a 32-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while regression analysis was used for hypotheses testing. Kyap reported that sense of belonging skills significantly improved the performance of secondary school students in mathematics in Rwanda. Female students were reported to have been influenced more than their male counterparts. Kyap's study is closely related to this study in so many ways. Both studies treated the same variables (sense of belonging skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this study addressed other social development indices unlike Kyap's work that focused only on sense of belonging skills. Also, Kyap tested hypotheses with regression analysis while this study used z-test statistic. Furthermore, respondents in Kyap's study were students while teachers were used as respondents in this study. Notwithstanding, Kyap's study and findings aided inferences in this study.

Umar (2018) investigated the impact of sense of belonging skills on students' performance in mathematics in Bichi Education District of Kano State. Umar adopted a descriptive survey design. five research questions and five hypotheses guided the study. A 17-item structured questionnaire was used for data collection. The questionnaire was validated by three research experts and had a reliability coefficient of 0.86. Mean, standard deviation and t-test were used for data analyses. In the major findings, Umar reported that the sense of belonging skills of the sampled students did not make any significant impact on their academic performance. The situation was same for public and private schools students. Umar's study is consistent with this study though Umar compared influence of sense of belonging skills on public school students with those of private schools while this study was interested in gender. Umar used t-test to test hypotheses but this study used z-test statistic. Umar treated only sense of belonging skills while this study added four

more indices of social development. Also, Umar focused on general academic performance while this study focused on performance in mathematics. However, Umar's study was very useful to this study, especially in interpretation of results.

Studies on Tolerance Skills

On tolerance skills, Zadan (2018) in a descriptive survey guided by four research questions and four hypotheses sought to examine the extent to which students' tolerance skills influence their academic performance in Istanbul, Turkey. Stratified and simple random sampling techniques were combined in drawing a sample of 168 students. 78 of the students were males while 90 were females. A 28-item structured questionnaire was used for data collection. The questionnaire was validated by five experts and yielded a reliability coefficient of 0.78. Mean was used to answer the research questions. t-test statistic was used for testing the hypotheses. Major findings of the study revealed that the students' tolerance skills influenced their performance in mathematics to a low extent. It was same for both male and female students. Zadan did not cover all the indices of social development skills covered in this present study. Zadan used different statistical tools for data analyses. Zadan's study and this present study treated influence of gender. Also, both studies adopted same design. The aspect of social development (tolerance skill) covered by Zadan was a component of this study, thus, they are very much related.

Charles (2019) investigated the relevance of tolerance skills on students' performance in mathematics in Michigan, USA. Charles adopted a descriptive survey design. Six research questions and six hypotheses guided the study. A 22-item structured questionnaire was used for data collection. The questionnaire was validated by three research experts and had a reliability coefficient of 0.72. It was scored on a five-point scale. Mean, standard deviation and chi-square were used for data analyses. In the major findings, Charles reported that the tolerance skills of the sampled students were very relevant for promoting their performances in mathematics. The influence was same for both male and female students. Charles's study is consistent with this study. Both studies

were interested in tolerance skills and influence of gender. Charles used chi-square to test hypotheses but this study used z-test statistic. Charles treated only tolerance skills while this study treated four more indices of social development skills. However, Charles's study was very useful to this study, especially in interpretation of results.

Vasco (2019) sought to determine teachers' perception of social development skills needed by high school students for learning mathematics in Helsinki, Finland. Descriptive survey was adopted as design of the study. Six research questions and six hypotheses guided the study. A sample of 182 teachers was drawn from sampled high schools in Helsinki, Finland. The sample consisted of 112 female teachers and 70 male teachers. Proportionate and simple random sampling techniques were used to draw the sample. A 32-item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher. It was graded using a 4-point scale. Mean and standard deviation was used to answer the research questions. Hypotheses were tested at 0.05 level of significance using z-test statistic. Major findings of Vasco's study revealed that the social development skills needed by the students as perceived by their teachers included; relationship, tolerance, decision-making, goal orientation, sense of belonging and teamwork skills. Male teachers perceived these skills higher that their female counterparts. Vasco's study and this present work are closely related. Both studies treated the same variables (social development skills and gender), adopted same design, used similar respondents and scored their responses same way. Also, both studies used same tools for data analyses. Moreso, five out of the six indices of social development perceived to be important by Vasco's respondents are major variables in this study. Thus, Vasco's study was very useful in discussing findings of this study, where useful comparison was made.

Kayto (2016) tried to determine teachers' perception of social development skills needed by secondary school students for learning mathematics in Gboko Education Zone of Benue State. Descriptive survey was adopted as design of the study. two research questions and two hypotheses guided the study. A sample of 177 teachers was drawn from 47 secondary school in Gboko Education

Zone of Benue State. The sample consisted of 60 female and 125 male teachers. Stratified and simple random sampling techniques were used to draw the sample. A 19-item structured questionnaire was used for data collection. The questionnaire was constructed by the researcher. It was graded using a 4-point scale. Mean was used to answer all the research questions. Hypotheses were tested at 0.05 level of significance using Analysis of Variance (ANOVA).

Major findings of Kayto's study revealed that the social development skills needed by the students as perceived by their teachers included; decision-making, relationship, sense of belonging, tolerance skills and goal orientation. Female teachers perceived the need for these indices more than their male counterparts. Kayto's study and this present work are very closely related. Both studies treated the same variables (social development skills and gender), adopted same design, used similar respondents and scored their responses same way. However, they differ in data analyses. Kayto answered research questions with mean only, but this study used mean and standard deviation. Kayto tested hypotheses with ANOVA but this study used z-test statistic. As can be observed, the five indices of social development perceived to be important by Kayto's respondents were the same indices investigated in this present study. Thus, Kayto's study was very useful in discussing findings made in this present study.

Enyi (2017) conducted a descriptive survey to ascertain the usefulness of tolerance skills in improving students' performance in mathematics in Afikpo Ebonyi State. 252 secondary school students drawn from 8 secondary schools in Afikpo was used as sample for the study. simple random sampling techniques was used to draw the sample. two research questions and two hypotheses guided the study. Instrument used for data collection was a questionnaire made up of 15-items and graded on a 4-point scale. Research questions were answered with mean and standard deviation while t-test was used for hypotheses testing. Enyi reported in major findings that tolerance skills were very useful in improving the performance of secondary school students in mathematics. Performance of the male and female were influenced equally. Enyi's study and this present one treated the same variables (tolerance skills and influence of

gender). Also, both studies adopted same design and same statistical tools for answering research questions. on the other hand, this present study addressed four other social development indices in addition to tolerance skills treated by Enyi. Also, Enyi tested hypotheses with t-test while z-test statistic was used in this study. More-so, respondents in Enyi's study were students while teachers were used as respondents in this study. Notwithstanding, Enyi's findings guided inferences in this study.

Studies on Relationship Skills

Al-Jaradeen (2016) undertook a survey to examine the correlation between relationship skills and students' performance in mathematics in New Delhi, India. Three research questions and three hypotheses guided the study. Design for the study was correlational design. A sample of 600 respondents was drawn by purposive sampling techniques. The sample was made up of 360 males and 240 female students. A 30-item questionnaire was used for data collection. Mean and standard deviation were used to answer the research question while Person's correlation was used to test hypotheses. Al-Jaradeen's finding showed that relationship skills improved students' performance in mathematics significantly. The improvement was same for male and female students. Al-Jaradeen's study is consistent with this study in many areas. They both focused on relationship skills, students' performance in mathematics and influence of gender. Al-Jaradeen's study and this present study differed in design and statistical tools for data analyses. Al-Jaradeen studied only relationship skills while this study covered four more components of social development. Al-Jaradeen used students as respondents while teachers were used as respondents in this study. Nevertheless, Al-Jaradeen's work aided inferences in this study.

Pedro (2018) undertook a study to determine the need for relationship skills among secondary school students in Scotland. The design for the study was a combination of expo-facto and a descriptive survey. Two research questions and four hypotheses guided the study. A 44-item checklist was used to collect data. A sample of 3000 students was drawn for the study. To do this,

purposive sampling technique was used. Out of the 3000 students, 1800 were females and 1200 were males. Mean and standard deviation were used to answer the research questions while hypotheses were tested with Analysis of Variance (ANOVA) at 0.05 level of significance. Pedro reported that relationship skills were highly needed by the students. Male students valued the skills more than their female counterparts. Pedro's study differed from this present study in choice of design where Pedro combined Expo-facto and survey but this study adopted only survey design. Instrument for data collection in Pedro's study was Checklist while questionnaire was used in this study. Pedro also differed in statistical tool for data analyses. Pedro used students as respondents while teachers were used as respondents in this present study. However, Pedro's study and this present study relate very well in some aspects. Relationship skills covered in Pedro's work is part of this study. More-so, Pedro considered gender influence as done in this study. Therefore, Pedro's study aided conclusions that were made in this study.

Becky (2019) worked on need for enhancing secondary school students' mathematics performance through relationship skills in Pretoria, South Africa. Descriptive survey was adopted as design of the study. Four research questions and eight hypotheses guided the study. A sample of 53 teachers was drawn by cluster and simple random sampling techniques and used for the study. A structured questionnaire made up of 17 items, scored on a 4-point scale was used for data collection. The instrument was constructed by the researcher, validated by three research experts and yielded a reliability coefficient of .69. Mean was used to answer the research questions while z-test statistics was used to test the hypotheses at 0.05 level of significance. According to Becky, findings of the study showed that relationship skills were highly needed for enhancing secondary school students' performance in mathematics in Pretoria, South Africa. Male and female teachers did not differ significantly in their perceptions in Becky's study. This present study is wider in scope as it treated other indices of social development unlike Becky's study which was concerned only with relationship skills. Becky used only mean to answer research questions whereas this study used mean and standard deviation to answer research

questions. Yet, Becky's study is very consistent with this study and was very useful in drawing rational conclusions as both studies treated relationship skills and gender influence as variables.

Chieze (2016) conducted a descriptive survey aimed at discovering the importance of relationship skills in improving students' performance in mathematics in Ikwere, River State. 312 secondary school students were drawn from 12 secondary schools in Ikwere and used as sample for the study. Technique used was simple random sampling. two research questions and three hypotheses guided the study. Instrument used for data collection was a 14-item questionnaire graded on a 4-point scale. Research questions were answered with mean and standard deviation while t-test was used for hypotheses testing. In major findings, Chieze reported that relationship skills were very important in improving the performance of secondary school students in Mathematics. Performance of female students were influenced more than their male counterpart. Chieze's study is closely related to this present study in so many ways. both studies treated the same variables (relationship skills and influence of gender). Also, both studies adopted same design and same statistical tools for answering research questions. However, this present study addressed other social development indices unlike Chieze's work that focused only on relationship skills. Also, Chieze tested hypotheses with t-test while z-test statistic was used in this study. Furthermore, respondents in Chieze's study were students while teachers were used as respondents in this study. Notminding these differences, Chieze's findings supported inferences in this study.

CLUSTER IV

SUMMARY OF REVIEW OF RELATED LITERATURE

CHAPTER 34

Topic:

EFFECT OF AUDIO ANIMAION INSTRUCTURAL MEDIA ON MIDDLE BASIC EDUCATION PUPILS' ACHIEVEMENT AND INTEREST IN ENGLISH LANGUAGE IN AGBANI EDUCATION ZONE

Literature review under this topic can be summarized thus:

In this chapter, efforts were made to review literature related to all the variables in the study. The first section dealt with conceptual framework. In the section, the following concepts were discussed; Teaching and Learning of English language, Teaching and Learning of Literacy, Audio Animation, Charts, Basic Education, Achievement, Interest and School Type (Public/Private). The second section treated theoretical framework. Here, the Piaget's Cognitive Developmental Stage Theory, Gagne's Theory of Hierarchical Learning and Ausubel's Subsumption Theory were expounded. The third section explored empirical studies relating to the study which include; studies on pupils' achievement in literacy, studies on pupils' interest in literacy and studies on influence of school type on pupils' achievement and interest in literacy.

Generally, the review implicated methods of teaching literacy as a significant factor that could influence pupils' achievement and interest in literacy. It further revealed that the search for the best method is still ongoing, thus, creating a gap which this study attempted to fill. Review of empirical studies, in the same vein, revealed conflicting results on the effect of Audio Animation Instruction Media for teaching and learning purposes. This was yet another gap that necessitated a study of the nature of this work. Likewise, an attempt was made to explore the effect of school type on pupils' achievement and interest in literacy. The results of the review followed the same path of no definitive conclusions on

whether public schools' pupils achieved higher and showed more interest in literacy topics more than their private schools' counterparts or otherwise. The interaction between school type, teaching method and pupils' achievement and interest in literacy is yet to get a definitive answer. This is another important gap the researcher aspired to fill.

CHAPTER 35

Topic:

INFORMATION AND COMMUNICATION TECHNOLOGY COMPETENCIES NEEDED FOR EFFECTIVE TEACHING AND LEARNING OF EDUCATIONAL TECHNOLOGY COURSES IN UNIVERSITIES IN SOUTH EAST NIGERIA

Literature review under this topic can be summarized thus:

Literature review in this study was organized under three sub headings; conceptual framework, theoretical framework and empirical studies. Conceptual frame work covered concepts of Information, Communication, Technology, Information and Communication technology (ICT), Information and Communication Technology Competencies, University Education, Educational Technology, Effective Teaching and Learning of Educational Technology Courses and Influence of Gender. The robust conceptual review unveiled perceptions of various authors on each concept. Summarily, the review showed that thoughts on those concepts are evolving, giving room for different experts to perceive them from different dimensions and creating room for new studies such as this present one.

The study was anchored on three theories; Gunilla Bradley's Convergence Theory on ICT, society and human beings, Fred Davis' Theory of Technology Acceptance and John Sweller's Cognitive Load Theory. Gunilla Bradley set to address interdisciplinary research and development on the interplay between ICT, Society, and Human Beings. Bradley posited that all technologies are for humans and should facilitate and improve our wellbeing and quality of life. The primary objective of Fred Davis' theory of Technology Acceptance was to shed light on the processes underpinning the acceptance of technology, in order to predict the

behaviour of and provide a theoretical explanation for the successful implementation of technology. In the cognitive load Theory, John Sweller propounded that for learning to be efficient, the amount of cognitive load imposed must not exceed the capacity available. The three theories were expounded and properly linked to the topic of this study. In the last section of the literature review, empirical works relating to major variables in this study were reviewed. In a nutshell, the review of related empirical studies identified the gap of no definitive conclusion on the ICT competences required for effective teaching and learning of Educational Technology courses in universities. Also, the review revealed conflicting findings on the influence of gender on the topic under study. These created the gap that this study sought to fill. This gap, if not handled properly and adequately will adversely affect educational outcomes.

CHAPTER 36

Topic:

STUDY SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED ACADEMIC PERFORMANCE IN COMPUTER STUDIES IN ENUGU STATE

Literature review under this topic can be summarized thus:

Literature review was done in three segments, namely; conceptual framework, theoretical framework and **e**mpirical studies. Conceptual framework dealt with all related concepts such as; concept of study skills (reading concentration, time management, note taking and preparation for examination skills), concept of academic performance and influence of gender. In summary, the conceptual literature review gave a better and in-depth insight into the various concepts and variables of the study. The review also showed that thoughts, definitions and explanations of the concepts are still evolving. The theoretical framework expounded theories related to the study namely; Bandura's Social Cognitive Learning Theory and Reynolds and Walberg Theory of Academic Achievement. In the social cognitive theory, Bandura states that "social and cognitive factors, as well as behaviour play important role in learning". Reynolds and Walberg in their own theory posited that psychological characteristics of individual students and their immediate psychological environments influence educational outcomes such as academic performance (cognitive, behavioral and attitudinal).

The third segment was devoted to empirical studies which covered studies on reading, concentration, note taking, time management and preparation for examination skills. It most importantly, highlighted major gaps which include, no definitive conclusion on the study skills needed by secondary school students

for improved academic performance in computer studies. Also, there was conflicting results on male and female teachers' perception of the study skills needed by Secondary School students for improved academic performance in computer studies. These gaps justify the need for more studies such as this present one on this topical issue.

CHAPTER 37

Topic:

TECHNOLOGY AND ENHANCEMENT OF EDUCATIONAL MANAGEMENT PRACTICES IN SECONDARY SCHOOLS IN ENUGU STATE

Literature review under this topic can be summarized thus:

Literature review was done in three segments, namely; Conceptual Framework, theoretical Rationale and Empirical studies. Conceptual framework dealt with all related concepts such as concept of technology, information and communication technology, educational management Practices; planning, staff development, staff welfare, supervision of instructional procedures and enforcement of discipline. Influence of technology on educational management practices and influence of school ownership on technology and educational management practices. This first segment availed the researcher a deeper insight into major variables under study. In the second segment, the researcher reviewed the theories on which this study leans. They include Fred Davis' Theory of Technology Acceptance, George Elton Mayo's Theory of Human Relations and Robert House's Path Goal Theory of Leadership. In the Theory of Technology Acceptance, Fred Davis suggested that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. These factors include perceived usefulness (**PU**) and Perceived ease-of use (**PEOU**). Davis defined *Perceived usefulness* (**PU**) as "the degree to which a person believes that using a particular technology would enhance their job performance". While perceived ease-of use (**PEOU**) is "the degree to which a person believes that using a particular technology would be free from effort". All these will influence users' attitude and intention (Acceptance to use technology). George Elton Mayo in the Theory of Human Relations recommended that what is desired, is for a

worker to produce (all by himself) a set of tasks. That is challenging and, therefore motivational. Mayo made case for humanistic organization where organizations must aid the creation and maintenance of stable, effective working groups since participation in small groups is a fundamental desire. Robert House in the Path Goal Theory of Leadership posited that a leader's behaviors is motivating or satisfying to the degree that the behavior increase subordinate goal attainment and clarified the paths to their goals.

The third segment was devoted to empirical studies review where studies relating to technology and enhancement of planning, staff development, staff welfare, supervision of instructional procedures and enforcement of discipline were reviewed and related to this research work. This segment most importantly, highlighted major gaps which include no definitive conclusion on principals' ratings regarding technology and enhancement of educational management practices in secondary schools. Hence, this study is worthwhile as it seeks to reach this gaps.

CHAPTER 38

Topic:

EFFECT OF USE OF CHATBOTS ON ACADEMIC ACHIEVEMENT AND RETENTION OF SECONDARY SCHOOL STUDENTS IN COMPUTER STUDIES IN ENUGU STATE

Literature review under this topic can be summarized thus:

In this chapter, efforts were made to review literature related to all the variables in the study. The first section dealt with conceptual framework. In the section, the following concepts were discussed; concept of Chatbots, Educational use of Chatbots, concept of achievement, concept of retention, gender influence on use of Chatbots, school location influence on use of Chatbots and school ownership influence on use of Chatbots. The second section of literature review was devoted to theoretical framework. This study was anchored on two theories namely; Bruner's Theory of Cognitive Development and Wertheimer's Theory of Problem Solving. Bruner's characteristics of reasoning in logical fashion, solving complex problems and analyzing possible options or alternatives were all portrayed as characteristics of the use of Chatbots for instructional purposes. Bruner's Cognitive Development theory was further linked to use of Chatbots in teaching and learning of computer studies in four major ways, namely; discovery, intuition, translation and readiness.

Wertheimer offered several ways of conceptualizing what happens during insight. According to Wertheimer, insight involves building a schema in which all the parts fit together; suddenly reorganizing the visual information so it fit together to solve the problem; restating a problem's givens or problem goal in a new way that makes the problem easier to solve; removing mental blocks and finding a problem analog (i.e., a similar problem that the problem

solver already knows how to solve). All these attributes were proper linked to use of Chatbots as instructional aid.

Review of empirical studies, in the same vein, revealed conflicting results on the effect of Chatbots for teaching and learning purposes. This is yet another gap that necessitated a study of the nature of this work. Likewise, an attempt was made to explore the effect of school ownership/location on students' achievement in computer studies with regards to their gender. The results of the review followed the same path of no definitive conclusions on whether public schools students achieved higher in computer studies topics more than their private schools' counterparts or otherwise. The interaction between school ownership, teaching method and students' achievement in computer studies is yet to get a definitive answer. This is another important gap the researcher aspires to fill.

CHAPTER 39

Topic:

PRINCIPALS' MANAGERIAL PRACTICES AS DETERMINANT OF TEACHER PRODUCTIVITY IN SECONDARY SCHOOLS IN ENUGU STATE, NIGERIA

Literature review under this topic can be summarized thus:

Literature reviewed in this study was organized under three major sub-headings namely; conceptual framework, theoretical framework and empirical studies. Conceptual framework covered concepts of principalship, principals' managerial practices, teacher productivity and influence of principals' gender. Theories underlying the design of study were expounded in the theoretical frame work. These theories include; Human Relations Theory and Path Goal Theory of Leadership. These theories were found to be very consistent with major variables of this study. The last section of the literature reviewed covered studies on principals' managerial practices relating to internal supervision, studies on principals' managerial practices relating to performance appraisal, studies on principals' managerial practices relating to staff training, studies on principals' managerial practices relating to staff welfare and studies on principals' managerial practices relating to enforcement of discipline. The entire literature reviewed revealed a major gap. This gap was of conflicting findings on the topic of this discourse. Hence, a no definitive conclusion status on the principals' managerial practices as determinants of teacher productivity in secondary schools. These gaps of conflicting findings and no definitive conclusions suggest the need for another study such as this present one.

CHAPTER 40

Topic:

EFFECTS OF COMPUTER AIDED INSTRUCTION ON SECONDARY SCHOOL STUDENTS' INTEREST, ACADEMIC ACHIEVEMENT AND RETENTION IN COMPUTER STUDIES IN ENUGU STATE

Literature review under this topic can be summarized thus:

Review of related literature was done in three sections. The first section dealt with conceptual framework. In the section, the following concepts were discussed; concept of Computer-Aided Instruction (CAI), expository method of teaching, concept of interest, concept of academic achievement, concept of retention and concept of school ownership. This section gave the researcher more knowledge about the concepts, especially, as they fit into the topic of this research work. In the second section Piaget's Cognitive Development Stage Theory and Ausubel's Subsumption Theory were reviewed. In the Cognitive Development Stage theory, Piaget postulated that through processes of assimilation and accommodation, individuals construct new knowledge from their experiences.

Piaget posited that in order to encourage mental growth of learners, the experience of seeing things from varied perspectives is very necessary. In the subsumption theory, Ausubel made case for use of subsumers or advanced organizers to facilitate meaningful learning. Ausubel advised the teacher to tie the new material to what the learner already knows. This theories are in agreement with the use of Computer Aided instruction. The third section explored empirical studies relating to this work. Review of empirical studies highlighted conflicting results on the effect of Computer-Aided Instruction for teaching and learning purposes. This is a major gap that this study seeks to bridge.

CHAPTER 41

Topic:

DEPRESSION AND STIGMATIZATION AS PREDICTORS OF MARITALCONFLICT AMONG PARENTS WITH AUTISTIC CHILDREN IN ENUGU STATE

Literature review under this topic can be summarized thus:

Literature review in this study was organized under three major sub-headings namely; conceptual framework, theoretical framework and empirical studies. Conceptual framework covered concepts of depression, stigmatization, autism, conflict and gender influence. The review of these concepts highlighted a major gap of no definitive conclusion on whether or not depression and stigmatization could predict marital conflict among parents of autistic children. The same no definitive conclusion status existed on gender influence. Theories underlying the design of study were expounded in the theoretical frame work. These theories include; Beck's cognitive theory on depression, Talcott Parsons theory of labeling and Murdock's Theory of Marital Conflict. All these theories were found to be very consistent with major variables of this study. Beck's theory of depression addressed the concept of depression in a similar way to that conceived in this study. In like manner, Talcott Parsons theory of labeling presented stigmatization as a label or a mark that could dehumanize and reduce the self-worth of the stigmatized person, just as discussed in the study.

The last section of the literature review covered studies on depression, stigmatization and parenting role conflict among male and female parents with autistic children, studies on depression, stigmatization and marital verbal conflict among male and female parents with autistic children, studies on depression, stigmatization

and marital physical conflict among male and female parents with autistic children, studies on depression, stigmatization and marital economic conflict among male and female parents with autistic children and studies on depression, stigmatization and marital sex related conflict among male and female parents with autistic children. The empirical studies review indicated a major gap of conflicting findings.

While some researchers in their separate studies reported that depression and stigmatization significantly predicted marital conflict among parents of autistic children, other researchers in their separate studies found the contrary. That is, depression and stigmatization had no significant predictive relationship with marital conflict among parents of autistic children. In the same vein, the empirical study revealed conflicting findings on gender influence. While some researchers found more influence on male parents, some found more influence on female parents while others reported that gender influence was insignificant. These gaps of conflicting findings and no definitive conclusions suggest the need for another study such as this present one.

CHAPTER 42

Topic:

PROBLEM-SOLVING ABILITIES AS DETERMINANTS OF SECONDARY SCHOOL STUDENTS' ACHIEVEMENT AND RETENTION IN ALGEBRA IN ENUGU STATE

Literature review under this topic can be summarized thus:

The review of related literature was done under three main sections. The first section dealt with conceptual framework which consisted of concept of problem-solving, problem-solving abilities, concept of achievement and retention, concept of algebra, and Influence of school location. The second section discussed the theoretical framework underlying the design and implementation of the study. Here the Wertheimer's Theory of Problem-solving and Information Processing was discussed. The third section reviewed some related empirical studies. Studies based on variables covered in this study were reviewed. Summarily, the literature review revealed great gaps. The gaps include; conflicting results on the influence of the students' problem-solving abilities on their achievement, interest and retention in mathematics and the report of no negative relationship between problem solving abilities and student's achievement, interest and retention in mathematics in all the studies reviewed. All these gaps, necessitated further investigation in a study such as this present one.

CHAPTER 43

Topic:

COUNSELING STRATEGIES ADOPTED BY SECONDARY SCHOOL PRINCIPALS FOR CONFLICT MANAGEMENT IN SECONDARY SCHOOLS IN ENUGU STATE

Literature review under this topic can be summarized thus:

Literature review in this study was organize under four major sub headings namely; conceptual frame work, theoretical studies, theoretical frame work and empirical studies. Conceptual frame work covered issues on counseling, Conflict, Conflict Management strategy, Principalship, secondary education, urban and rural school and gender. These are important areas that form the thrust of the study. Theoretical studies discussed are Allow the Client to Explore (ACE), Using Silences in the Relationship (USR), Using Paraphrasing, Using REBT Challenges (URC), Using Positive Verbal Encouragements (UPE) and Directive Counseling (DC) as strategies for conflict management in secondary schools in Enugu state. These are the variables that are discussed in the study.

Theories underlying the design of study were expounded in the theoretical frame work. These theories include; Maslow Theory of Conflict, Human Needs Theory, Conflict Resolution Theory, Client centered theory and Social Control Theory of Hirchi. In the last section of the study, empirical works on the variables discussed in the study were reviewed. In a nutshell, the review of related literature identified the gap that this study intends to fill. This gap, if not handled properly and adequately, educational outcomes will be adversely affected. This is because no meaningful teaching and learning can occur in an environment that is characterized with conflict. This explain the rationale behind identifying Counseling strategies to be adopted by principals of secondary school for conflict management.

CHAPTER 44

Topic:

TEACHERS' PERCEPTION OF SOCIAL DEVELOPMENT SKILLS NEEDED BY SECONDARY SCHOOL STUDENTS FOR IMPROVED PERFORMANCE IN MATHEMATICS IN ENUGU STATE

Literature review under this topic can be summarized thus:

Literature review was done in three segments, namely; conceptual framework, theoretical framework and **e**mpirical studies. Conceptual framework dealt with all related concepts such as; concept of social development, students' performance in mathematics and influence of students' gender. The theoretical framework expounded theories related to the study namely; social learning theory and theory of psychosocial development. The third segment was devoted to empirical studies which covered studies on goal orientation, decision-making, sense of belonging, tolerance and relationship skills. In summary, the literature review gave a better and in-depth insight into the study. It most importantly, highlighted major gaps which include, no definitive conclusion on the mathematics teachers' perception of social development skills needed by secondary school students for improved performance in mathematics. Also, there was conflicting results on the influence of gender on teachers' perception. Most striking was the gap of availability of very few local empirical studies on social development skills needed by secondary school students for improved performance in mathematics. Out of the 22 empirical studies reviewed, only six were conducted in Nigeria. Out of these six conducted in Nigeria, only one was conducted in the South-east Geo Political Zone of Nigeria. These gaps justify the need for this present study.

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