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The Teaching and Learning of Communication Skills in Secondary Schools Through Information Communication Technology

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Abstract:

The mastery of communication skills is the goal of the literacy drive advocated by the National Policy on Education. The advent of information communication technology is a modern invention geared towards accelerating effective teaching and learning processes if properly harnessed by educational institutions. The pedagogic object of utilizing ICT to inculcate language and communication skills is the main preoccupation of this paper. Likewise, the challenges: possibilities and problems of ICT to language teachers and learners are discussed.

Keywords: Teaching, Learning, Communication skills, ICT,

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Introduction

Communication, in this twenty-first century, has transcended the threshold of common parlance culminating into the present sophisticated information communication technologies. The transmission of messages, today through the ICT has pushed back the frontiers of science thereby making the world a global village. And to keep pace with this technological advancement, secondary students in particular need to be computer literate. Luther, (2022) posited that ICT motivates both teachers and learners thereby making the learning process tremendously enjoyable. Likewise, interactive computer networking allows students to test the result of learning without the risk of being punished for any mistake. Researchers have affirmed that ICT plays a vital role in the teaching/learning of the English language in schools, colleges and universities (Hossain, 2021). Information Communication Technology (ICT) has become a household term globally and has brought radical changes in the way people live, learn and work. It has become a veritable tool in education and training by linking students with information technology and improving innovations for teachers. ICTs are potentially powerful enabling tool for educational advancement and reform, when used appropriately; it will improve teaching and learning processes.

Information and communication technologies (ICT) are electronic technologies used for information storage and retrieval. Development is partly determined by the ability to establish a synergistic interaction between technological innovation and human values. The rapid rate at which ICTs have evolved since the mid 20th century, the convergence and pervasiveness of ICTs, give them a strong role in development and globalization (Danbaba, et al., 2022). ICTs have a significant impact on all areas of human activity. The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Zenda, & Dlamini, 2022). A great deal of research has proven the benefits to the quality of education (Chen, & 2021). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Borah, & Verma, 2022).

In a rapidly changing world, basic education is essential for an individual be able to access and apply information. Such ability must find include ICTs in the global village. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing counties, especially in Africa, are still low in ICT application and use (Yusuf, & Iyabo, 2022). This paper focuses on ICT application in Nigerian secondary schools. It particularly dwells on the importance of ICT and the causes of low levels of ICT application in Nigerian secondary schools. Recommendations for improvement are offered.

This was viewed as a major tool for building knowledgeable societies (UNESCO, 2013). In Nigeria, certain Government educational policies are aimed at enforcing this technological innovation on schools**.** This makes access to information through technology to grow exponentially. Business Education cannot remain a mere subject, rather it should be an innovative subject and schools need to improve in teaching and learning processes through the use of ICT. Therefore, the acquisition of ICT knowledge and skills can make it plausible learning over the lifetime (Senkbeil, 2022).

Information and Communication Technology (ICT) refers to all kinds of electronic system that are used for broadcasting, telecommunications and all forms of computer-mediated communications. It involves the use of online self-learning packages, interactive CDs chips, satellites, radio, optics fiber technology, tele-presence systems and all types of computer hardware or software (Sofroniou, 2018). Therefore, Information Technology (IT) is the use of computer systems and telecommunication equipment in information processing. It is made up of three basic components which are; electronic processing using the computer, transmission of information using telecommunication equipment and dissemination of information in multimedia. Information Communication Technology (ICT) has become integral part of

teaching and learning in schools as it provides opportunities for both teachers and students to learn how to operate in an information and technology age for better understanding of Education. However, literature shows that although educators appear to acknowledge the value of ICT, difficulties continue to be encountered in adopting and integrating such technologies (Koh, et al., 2022).

Although many teachers are comfortable with the emergence of technology in general, the state of ICT facilities both software and hardware, and the lack of adequate ICT text books affect effective teaching and learning . Additionally, the problem of information technology illiteracy was a serious one among teachers and students. That is, many teachers and students did not have basic computer appreciation skills and noted that the problem was a hindrance to efforts at achieving the use of ICT for educational purposes in schools. The problem of this study is to determine the extent of the use of ICT in teaching and learning in Nigeria (Koh et al., 2022).

Language Teaching and Learning

Language has been defined in various ways by different linguists and language specialists. Bohn et al., (2022) simply defined language as a set of signals by which we communicate. This presupposes passing information from one person to the other. Olowoyeye (2004) corroborated asserted that language is used by human beings as means of communication, interaction and expression of thoughts, ideas and so on. ICT has succeeded in making language more versatile in the exchange and transmission of feelings, facts and messages. Teaching has been defined in several ways. Firstly, perceived teaching as a profession; secondly as a cluster of activities, we engage in during some specific period. And thirdly as an act of a particular kind, i.e. movement of the body, or parts of the body, talking, pausing, explaining, reading, etc. (Robert, 2022). In a clearer and measurable term, Soko, (2022) postulated that effective teaching and learning is geared towards producing active, literate and numerate persons who can read and write with required understanding and communicate without any ambiguity. Teaching is also an all-purpose profession that stimulates the development of the mental, physical and emotional power of students. When properly done, this will produce educated citizens who would be sensitive and equipped with the imaginative resourcefulness to promote sound health, equality, peaceful coexistence, environmental management and a democratic process (Oyekan, 1994). Teaching performs such roles as: informing and explaining stimulating, directing, guiding and administering identifying what learn, identifying learning problems, evaluating, reporting, and recording-(Leiber, 2022).). Teaching is also pedestalled on some sound principles such as: Clear objectives, Pupil's readiness, Previous experience, Individual differences and Teaching should be systematic, proceeding from the known to the unknown.

Summarily, language, according to Hamidu (2004) is the study of the art of language which in effect involves the understanding of the importance of language as a vehicle of communication. Learning can be perceived as the acquisition of new knowledge, ideas, skills, values and experiences which enable the individual to modify or alter his actions. It also involves the utilization of the newly acquired knowledge or experience. Learning brings about permanent changes in the learner. Oyekan (1994), defined learning as a gradual change in behaviour that ought to be frequently practised and reinforced to prevent its extinction. It is perceived as a sort of biological adaptation as it occurs when the pupil adjusts to cope with the conditions of the educational environment and dynamic society.

Language learning is a process that is brought about in a classroom setting where | subject matter is selected, graded and activities are organized to promote the use of the language. The rules of the language are also internalized through the process of learning in the instructional setting (Seweje, 2006).

Language and Communication Skills

Afe, et al (2004) defined communication as the act of passing across information, news, or ideas to another person. In the same vein, Olowoyeye (2004) opined that it is the art of sharing, imparting and transmitting information with the sole aim of impacting behaviour, attitude and action.

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The communication skills are broadly categorized into four namely: (a) listening (b) speaking (c) reading and (d) writing. These skills can be further grouped into groups according to their relatedness. They are:

a. Receptive skills i.e. listening and reading skills.
b. Expressive or productive skills i.e. speaking and writing.

Hybel and Weaver II (2001) asserted that communication is transactional which involves not only the physical act of communicating but also a psychological act.

Information Communication Technologies

The status of ICT in Nigeria today is highly enhanced due to its diversified usages. The use of computers and electronic communication gadgets now permeate various sectors such as education, banking, commerce, banking, governance, administration, etc. The use of the electronic machine in the ongoing voters' registration is an example of the ICT drive. But this is not to say that a great percentage of Nigerian students are not ICT compliant. According to Seweje (2006) despite the copious exposure through GST courses in computers more than 80% of Nigerian undergraduates and graduates alike are unable to adequately utilize the computer. And more than 90% by a conservative estimate of the Nigerian secondary school pupils are unable to use the computer. While at the primary school level, less than 5% of the total population is computer literate.

In this information age, the pervasive impact of ICT on nearly all ramifications of human endeavours cannot be overemphasized. This is evinced in Oliver et al (1992) definition of ICT as the technology which supports activities that involve the creation, storage, manipulation and communication of information together with their related methods, management and applications. ICT also encompasses all forms of computer-mediated communication. These are well expatiated in Pearson et al (2003) as:

a. Electronic Mail (e-mail): makes use of an internet network to send messages to person(s) connected to the network.

b. Instant Messaging (IM): is a text-based form of synchronous communication which allows users to connect two computers near the internet and ennable a conversation between the computers. This is referred to as an internet chat. This can also make multiple users log on and interact with other users via the internet.

c. Bulletin Board System (BBS): is the use of a text-based asynchronous communication tool that allows users to pass across information to a large number of people.

d.Audio-Video Conferencing: is the use of the network to connect two or more multimedia-capable computers for live, interactive conversation using visual-auditory channels of communication.

e.Multi-User (MUDS): are web-based virtual worlds where the participant can interact and engage in fantasy role-playing, This is an emerging realm of entertainment.

f. E-Learning: According to Sloman (2001), this is the electronic connection of a dispersed group of learners and individualised curricula that can deliver instant learning on a global basis.

ICT and Secondary School English Language Curriculum

The National Curriculum was evolved to enhance the viability and fruition of the National Policy which according to the English Language a place of prominence. Section 4:19 (6a) of the policy placed the English Language, as the first of the six are subjects. Likewise, the national curriculum for the junior and senior secondary schools embodied content materials on (1) vocabulary development (2) comprehension: listening and reading (3) structures (4) spoken English (5) writing and (6) literature; (NERC, 1985).

1. According to Fatodu (1995), the criteria for the selection of these content materials are to inculcate in the student, not only linguistic and communicative competence but also the ability to appreciate, with a critical sense, literacy materials in English.

The curriculum also expressly stated its objectives as: *...to promote systematic development of both the language skills and the literacy knowledge that are considered essential for effective use of English in oral and written communication as well as learning other subjects in the curriculum".*

The application of ICT can help foster the teaching and learning of these skills. According to Fakeye and Aturamu (2006) such instructional materials as slide projector, video camera and cassette slides, multimedia laboratory, audio-visual aids, software and hardware consumables etc, can enhance learning tremendously.

Application of ICT on Communication Skills Teaching and Learning

ICT is permeating the learning environment at a very rapid rate. There are several attempts to reposition teaching and learning in line with the operational paradigm of ICT. The teaching-learning process is now being redesigned not only to accommodate but to reflect ICT in all its ramifications; Seweje (2006). Students can learn language skills pleasurably. This is made possible with the use of computers and laptops. Examples include:

a. Letter fun PC designed by Vtech christened Little Smart. It can be used to enhance the sounds produced by different animals that are matched with the animal when the appropriate keys are pressed. Spelling drills can be taught. The fun PC avails the little child the means of learning sounds of a letter (Oral-Aural skills) finding missing letters (spelling) etc.

b. The Vtech Pre-computer PC is well designed to teach and enhance the learning of spelling, word processing, word games, logic games etc. The secondary school pupil can easily learn on his own the language skills with fun.

c. Computer Games/VCD—there are various types of computer VCD. Some are quite educative and can be adapted by teachers and students alike in the teaching and learning of language skills.

This is corroborated by Seweje (2006) who outlined five (5) directing a language user could take to teach the language and communication skills. They are:

1. Commercial Software (CD-ROMs)—there are several language CD-ROMs and diskettes available in the market. Teachers should select the relevant available ones.
2. World Wide Web (www)—the www is quite an invaluable resource for language teachers and learners. Students can be aided to find sites that explain the various language skills.
3. The e-mail system. This can enable students to communicate with other teachers and learners of language at a very cheap rate when they operate their e-mail addresses.
4. Presentation Software includes PowerPoint, presentations which can be used to make slides accompany lectures and presentations as well as to stimulate conversation.
5. Authoring Software—this software allows teachers to create exercises, language drills to create exercises, language drills and activities in the multimedia laboratory.

Likewise, the internet can help networking with many computers throughout the world. These are:

LAN—Local Area Network

VAN—Wide Area Network

The LAN can be used in a locality like a school setting. Teaching can be conducted with learners hooked to the network in active participation. Also, the WAN is used to connect computers over a wide geographical area. It can even cover countries and continents. This can be very appropriate in integrating skills to students that are hooked to this network. Heathcote (2000) listed, among others, the advantages of LAN and WAN in the teaching of communication skills:

a. It allows the sharing of resources such as disk storage, printers, image scanners modems (Modulator/Demodulator=MODEM) and central servers. These can be used with relevant packages to inculcate the skills.

b. It allows electronic mail (e-mail) to be sent between users. This will enhance the exchange of responses to exercises and assignments between teachers and students.

c. It allows sharing of information held in disk drives accessible by all users. This enhances the transmission of instructions and assignments from teachers to learners. It allows the connection of different types of computers which can communicate with each other; etc.

The Challenges of ICT to Language Teachers and Learners

In this paper, the challenge is used to mean:

a. the possibilities of ICT,
b. the problems to be tackled in the use of ICT.

a. The Challenges (Possibilities) of ICT

Dwyer et al (1990) discovered that in a learning environment supported by ICT, teachers:

- are less predominant, students are more active,
- expect more from students;
- can present more complex materials;
- can effectively meet the needs of the individual students;
- are more willing to experiment;
- are more open to multiple perspectives on problems;
- feel more professional because they help people learn rather than dispense information,

b. Challenges (Problems to be tackled) of ICT

It is not an overstatement that more than 90% of teachers and lecturers of language are not ICT compliant. This was corroborated by Seweje (2006) as enforcement. But this challenge can be confronted.

1. Teachers should strive to be ICT compliant by being involved.
2. They must broaden their horizon on the use of ICT. Stefansdotir (2001) observed that a teacher has to understand that ICT is to be used as a tool. Therefore, usage in the classroom calls for a level of knowledge of the technology. ,
3 Teachers should develop procedures to solve problems and inculcate relevant skills.
4. Be adept in the use of computer programs including drills, tutorials, simulation, information retrieval, and data management.

Conclusion

The advent of ICT has extended the frontiers of knowledge and enriched the teaching and learning process. The language teachers could, with the use of ICT, disseminate knowledge, skills, information better. It is therefore highly imperative that '.ge and communication teachers be up-to-date in the use of ICT for better performance. Learners as well have to be well-groomed in the use of ICT. The use of ICT both by the teachers and learners could be very costly. Therefore, the government will need to come to their aid. This could be in form of grants, provision of the appropriate ICT tools, etc.

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A Comparative Study On the Utilization of Calcium by Wad Goats Fed Groundnut Cake, Activated Sewage Sludge and Poultry Waste Based Diets

Author(s), OLOWOYEYE, Janet Chinwe

Abstract:

A comparative study on the effective utilization of calcium in Groundnut Cake (GNC), Dried Activated Sewage Sludge (DASS) and Poultry Waste (PW) based diets was carried out using Eighteen (18) West African Dwarf (WAD) goats. Calcium in the 3 different diets were highly digestible and therefore well-utilized. Digestibility coefficient (%) of calcium in the three (3) diets are as follows: 36.74, 75.43 and 53.82 respectively. Statistical analysis ($P<0.05$) showed significant treatment effects for intake, digestibility, and balance of Ca.

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Introduction

The chronic shortage of conventional oil cakes for livestock feeding in most developing countries has compelled the search for alternatives for these costly protein supplements. Groundnut cake is the conventionally used protein supplement in the ration of ruminants in most parts of the country but at times its limited supply and seasonal availability escalate its cost (Nagalakshmi & Dhanalakshmi, 2015). The use of animal waste to replace groundnut cake in feed formulation would lower cost and livestock production and lead to a significant reduction in the cost of milk, meat, and other livestock products. According to Tadele (2015), animal wastes represent a vast reservoir of cheap nutrients, particularly for ruminants. A lot of work has been done on the ability of indigenous livestock to effectively utilize the protein and energy present in animal wastes however little importance has been given to the utilization of some of the major minerals in animal wastes by indigenous livestock in Nigeria. But as reported by IAEA (1971), the production of the much-needed animal protein can be severely curtailed when unrecognized conditions of deficiency, oversupply or imbalance of minerals exist and interfere with the intensification of livestock production. Poultry wastes as a dietary supplement have been used successfully to feed ruminants (Oltjen & Dinius, 1976) and Poultry (Ologhobo & Oyewole,1986).

Dried Activated Sewage Sludge is the solids left after the processing of Sewage through a waste treatment plant (Sebastian & Mariusz, 2019; Anna & Aneta, 2019) and has been incorporated in small quantities into the diets of ruminants (Adeleye et al., 1987), poultry (Biobaku et al., 2021), Pigs (Ekpenyong et al., 1989). Sewage sludge has sufficient required nutrients to be attractive for animal feed. Activated sewage sludge and Poultry wastes have been used extensively as feed for various classes of animals however, their mineral contribution to livestock production is yet to be fully explained compared with energy and protein. Therefore, the present study is designed to contribute to the existing knowledge of Groundnut cake, activated sewage sludge and Poultry Wastes as livestock feed by appraising the utilization of calcium in these feeding stuff when fed as a supplement to West African Dwarf Goats.

Materials and Methods

Experimental Site and Sample collection

This feeding trial was carried out at the Teaching and Research Farm of the University of Ibadan, Ibadan. The Poultry droppings were collected from the layer unit of the Teaching and Research Farm of the University of Ibadan, Ibadan while The Dry Activated Sewage Sludge was obtained from the sewage treatment plant of the University College Hospital (U.C.H.), Ibadan

Experimental Diets

Three different test diets were prepared for this trial. Diet one, the control ration, was made up of a basal diet plus a concentrate ration made up of Groundnut cake (GNC), diet two consisted of a basal diet plus a concentrate ration in which Dried Activated Sewage Sludge (DASS) was used to replace GNC while diet three consisted of a basal diet plus a concentrate ration whereby Poultry Waste (PW) was used to replace GNC as the source of Nitrogen. They were all isonitrogenous. The per cent composition and the proximate analysis of the experimental diets are shown in Tables 1 and 2 respectively.

Table 1: Percent Composition of Experimental Supplement Ration

Ingredients	**Diet one**	**Diet Two**	**Diet Three**
Cassava flour	49.5	37.0	32.5
Groundnut cake	25	-	-
Dried Activated Sewage Sludge	-	37.5	-
Poultry Waste	-	-	42
Dried brewers' grain	25.0	25.0	25.0
Mineral Mixture	0.25	0.25	0.25

Salt	0.25	0.25	0.25

Table 2: Proximate Composition of the Supplemental Rations

	Grass	Supplemental Ration		
		Diet I (%)	Diet II (%)	Diet III (%)
Dry Matter	62.1	94	97	98.3
Crude Protein	6.8	19.3	14.8	18.6
Crude Fiber	51.9	9.5	25.7	18.8
Ether Extract	1.5	2	2.5	3.5
Ash	5.0	6	33.5	8.5
N.F. E	34.9	63.3	23.5	50.6

Experimental Layout and Animal Management

Each diet was replicated six (6) times with one goat per replicate. The goats certified free from helminths and intestinal parasites were kept in individual metabolism cages designed for separate collection of urine and faeces. Each animal was fed daily with 1kg of the basal diet made up of giant Star grass (Cynodon nlemfuensis) plus 1kg of concentrate. They had free access to fresh and clean water daily. The feeding period consisted of a preliminary feeding period of 2 weeks followed by a 3-day collection period. The preliminary period was to allow the animal to adjust to the experimental diet. Feeds leftover from the previous day's ration were collected and weighed daily to estimate the feed intake by each animal. Each animal was weighed both at the beginning and the end of the collection period.

Faecal Collection

Faeces of each animal were collected each morning during the 3-day collection period before feeding the animal its ration for the day. The faeces collected daily from each animal during the collection period were weighed and dried at 70°c in the hot air oven to constant weight. The dried samples were bulked and stored at room temperature until required for chemical analysis.

Analytical Procedure

Dry matter was determined as described by AOAC (1970). One gram of the dried faeces was weighed separately into Kjeldahl flasks for digestion using 20mls of Nitric acid and 4mls perchloric. The percentage of calcium in the digest was determined using an atomic absorption spectrophotometer.

Statistical Analysis

The data from the feeding trial were subjected to an Analysis of variance in compliance with Steel and Torrie (1960).

Results and Discussion

The proximate Analysis for the three diets is shown in Table 2. The dry Matter content of Diet III was highest (98.3%), followed by Diet II (97%) and Diet I (94%). The Crude Protein content of Diet I was highest with a value of 19.3% followed by Diet III (18.6%) and Diet II (14.8%). Diet II had the highest Crude Fibre and Ash content.

Feed Intake and Weight Gains of Animals on the Three Experimental Rations

Table 3 shows the daily dry matter intake per metabolic size of the WAD Goats. The mean intakes for Diets

I, II and III were 173.5gms, 87.51gms, and 158.57gms respectively. The low intake of Diet II could be because high levels of inclusion of DASS in a ration cause some reduction in acceptability (Hacker et al, 1957). This also agrees with Adeleye et al., (1987), who observed adverse effects with sheep fed up to 40% of DASS. Statistical analysis showed that treatment effects were highly significant (P<.01). On further subjection to Duncan's multiple range test, significant differences were obtained between the means of Diet I and Diet II and between the means of Diet II and Diet III. There was no significant difference observed between the means of Diet I and Diet III.

Table 3: Daily Dry Matter Intake Per Metabolic Size by Goats Fed Gnc, Sewage and Poultry Waste Diets

REPLICATE	I	II	III
1	180.42	173.81	150.97
2	163.56	140.36	163.28
3	185.76	75.44	151.65
4	209.29	43.23	157.4
5	174.83	49.98	157.42
6	127.15	42.23	172.5
N	173.5	87.51	158.57
SD	27.31	56.22	8.05

X = mean.
SD = Standard deviation

Table 4: Summary of Change in Weight of WAD Goats Fed Groundnut cake and Sewage Sludge and Poultry Waste based diet

Diet	Mean Initial Weight(kg)	Mean Final Weight(kg)	Mean Changes in Weight (kg)
I	**5.8**	**6.2**	**0.38**
II	**5.6**	**5.5**	**-0.06**
III	**5.9**	**6.1**	**0.23**

The performance of the goats was quite encouraging. Although goats on GNC-based diets recorded the highest growth rate (6.2kg, Table 3), the apparent differences were not statistically significant (P < 0.05). This showed that DASS and PW could successfully replace GNC. The mean growth rates obtained for goats on all treatments were quite meaningful for WAD goats receiving adequate voluntary DM intake (Akinsoyinu & Adeloye, 1987). Digestibility' coefficients (Table 5) seem to be quite reasonable for ruminants (Adebowale & Ademosun, 1985).

TABLE 5: Summary of Apparent Digestibility of the Ration

Diet	DM Intake(g/day)	Faecal Output (DM/g/day)	Digestibility coefficient (%)	SD
I (GNC)	664.57	101.52	84.69	4.4
II (DASS)	321.78	51.48	82.22	10
III (PW)	606.06	136.18	78.43	9.6

The mean apparent digestibility coefficients of the three experimental diets are depicted in Table 5. Diet I had an apparent digestibility coefficient of 84.69%, Diet II, 82.22% and Diet III, 78.43%. The results showed that all the diets were highly digestible. Table 5 also shows that animals on diet II consumed little of the feed and excreted also very little of the feed in their faeces. They utilized the little they consumed as can be seen

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by the high digestibility coefficient. The high digestibility observed for diet II could be due to the fact that most of the Dry matter intake of goats fed diet II was from the grass. Goats according to Davendra (1971) have a high digestive efficiency for cellulose found in poor quality grasses with high crude fibre content. Diet I was highly utilized by the animals. The data shows that animals on diet I had a mean dry matter intake of 664.57gms and a mean faecal output of 101.92gms as compared to Diet III where animals had a mean dry matter intake of 606.06gms and a mean faecal output of 136.18gms. The high intake of diet I could be due to palatability of the ration containing Groundnut cake (GNC) as compared to the rations containing animal wastes. Statistical analysis showed that the digestibility coefficient of the 3 diets were not significantly ($p > 0.05$) different.

Table 6: Summary of Calcium Utilization by WAD Goats Fed GNC, DASS and PW Based Diets

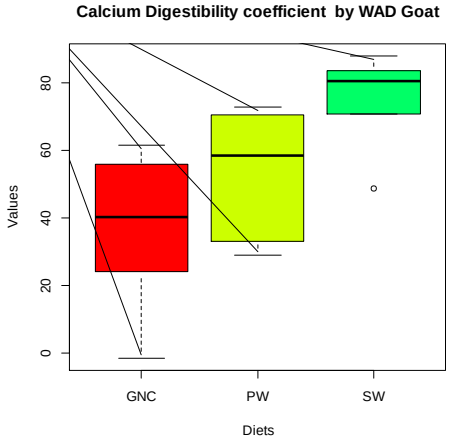
Diet	Calcium Intake (DM/g/day)	Calcium in Faeces (DM/g/day)	Apparent Digestibility Coefficient (%)	Calcium - balance (g/day)	Calcium-balance g/day/kgw$^{0.75}$
I	1.18^{a}	0.79^{a}	36.74^{a}	0.39^{a}	0.11^{a}
II	1.06^{a}	0.21^{a}	75.43^{b}	0.85^{a}	0.23^{a}
III	10.47^{b}	4.99^{b}	53.82^{ab}	5.48^{b}	1.48^{b}

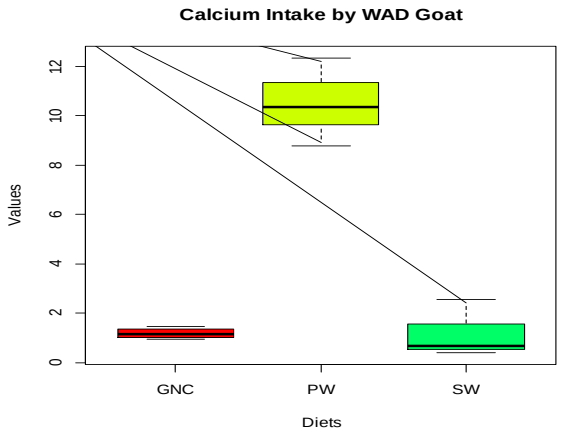
Diet I = Groundnut cake-based diet Diet II = Sewage sludge-based diet Diet III = Poultry waste-based diet

a,b,c = figures with identical superscripts are not significant ($P>0.05$)

Statistical analysis showed significant differences ($p<0.05$) for Calcium intake, feacal output and calcium balance per metabolic size of goats between diet 1 and diet III. There was however no significant difference between diet I and diet II for calcium intake, feacal output and calcium balance per metabolic size of goats. Calcium balance per metabolic size of goats was highest for diet III composed of poultry waste than for diets 1 and 11. This may be explained by the high contents of Ca in the diet. However, the apparent digestibility coefficient for Ca in Diet 3 was lower than that in Diet 2 but higher than that in Diet 1. Statistical analysis showed differences in Ca digestibility between the diets ($P<0.05$).

The Figures below show the box plot for calcium utilization in WAD goats fed GNC, DASS and PW Based Diets





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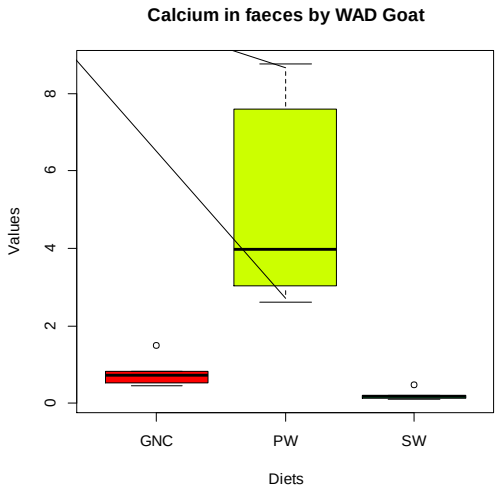

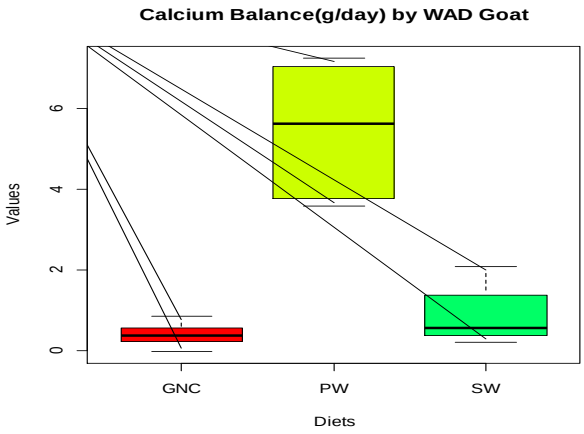

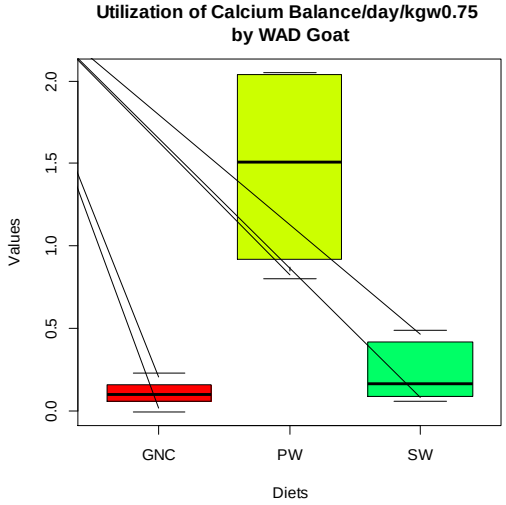

Correlation Analysis

Tables 7a,b and c show the correlation in utilization of calcium in GNC, PW and DASS

Table 7a: Correlation in Utilization of Calcium

GNC Correlation Matrix in CA	*CA.intake*	*CA.in.faeces*	*CA.Digestibility.coefficient*	*Ca.Balance*	*Ca.balance.day.kgw0.75*
CA.intake	1	0.617 *(.192)*	-0.276 *(.596)*	-0.087 *(.870)*	-0.094 *(.860)*
CA.in.faeces	0.617 *(.192)*	1	-0.886 *(.019)*	-0.838 *(.037)*	-0.841 *(.036)*
CA.Digestibility.coefficient	-0.276 *(.596)*	-0.886 *(.019)*	1	0.930 *(.007)*	0.936 *(.006)*
Ca.Balance	-0.087 *(.870)*	-0.838 *(.037)*	0.930 *(.007)*	1	0.999 *(<.001)*

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Ca.balance.day.kgw0.75	-0.094 *(.860)*	-0.841 *(.036)*	0.936 *(.006)*	0.999 *(<.001)*	1
Computed correlation used pearson-method with listwise-deletion.					

N.B: (0.192) means the significant level… Any value greater than the alpha value (0.05) means there is no significant different in the mean

Table 7b: Correlation in Utilization of Calcium

PW Correlation Matrix in Ca	*CA.intake*	*CA.in.faeces*	*CA.Digestibility. coefficient*	*Ca.Balance*	*Ca.balance.day. kgw0.75*
CA.intake	1	0.880 *(.021)*	-0.801 *(.055)*	-0.638 *(.173)*	-0.717 *(.109)*
CA.in.faeces	0.880 *(.021)*	1	-0.988 *(<.001)*	-0.927 *(.008)*	-0.957 *(.003)*
CA.Digestibility.coefficient	-0.801 *(.055)*	-0.988 *(<.001)*	1	0.970 *(.001)*	0.988 *(<.001)*
Ca.Balance	-0.638 *(.173)*	-0.927 *(.008)*	0.970 *(.001)*	1	0.987 *(<.001)*
Ca.balance.day.kgw0.75	-0.717 *(.109)*	-0.957 *(.003)*	0.988 *(<.001)*	0.987 *(<.001)*	1
Computed correlation used pearson-method with listwise-deletion.					

DASS Correlation Matrix in Ca	*CA.intake*	*CA.in.faeces*	*CA.Digestibility. coefficient*	*Ca.Balance*	*Ca.balance. day.kgw0.7*
CA.intake	1	0.865 *(.026)*	0.500 *(.312)*	0.995 *(<.001)*	0.959 *(.003)*
CA.in.faeces	0.865 *(.026)*	1	0.040 *(.941)*	0.814 *(.049)*	0.697 *(.124)*
CA.Digestibility.coefficient	0.500 *(.312)*	0.040 *(.941)*	1	0.573 *(.235)*	0.649 *(.163)*

Ca.Balance	0.995 *(<.001)*	0.814 *(.049)*	0.573 *(.235)*	1	0.979 *(.001)*
Ca.balance.day.kgw0.75	0.959 *(.003)*	0.697 *(.124)*	0.649 *(.163)*	0.979 *(.001)*	1
Computed correlation used pearson-method with listwise-deletion.					

Table 7c: Correlation in Utilization of Calcium

Conclusion

This study concluded that the differences observed were not significant. Values of calcium digestibility suggested that DASS and PW could successfully replace the conventional groundnut cake as sources of calcium in goat diets.

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Special Issue

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Effects of Brain-Based Strategy On Ekiti State Senior Secondary School Students' Learning Outcomes in Biology

Author(s), FALEMU, Funke Aina

Abstract:

The study examined the effects of brain-based strategy and conventional method on learning outcome of senior secondary school students in Biology in Ekiti State, Nigeria. The study specifically examined the difference between the academic performance of students exposed to brain-based strategy and conventional method before and after treatments; and the difference between attitudinal mean scores of students exposed to brain-based strategy and conventional method before and after treatment. This study adopted a pre-test, post-test, control group quasi experimental design in which two groups (one experimental group and one control group) was involved. The sample consisted of class intact size (139 students offering Biology) drawn from 6 public secondary schools in Ekiti State. The sample was selected using multistage sampling procedure. Two instruments tagged Performance Test in Biology (PTB) and Biology Attitudinal Scale (BAS) were used for collecting the data for the study. The face and content validity of the instrument was ensured by experts of Tests and Measurement and Biology Education. The study was carried out in three phases namely pre-treatment stage, treatment Stage, and post-treatment stage**.** Hypotheses 1 - 4 were tested using t-test at 0.05 level of significance. The findings of the study revealed that students exposed to brain-based strategy and conventional method were homogeneous at the commencement of the study but there was improvement in performance and attitude of students exposed to brain-based strategy after intervention. It was recommended that brain-based strategy should be incorporated as a strategy of teaching Biology in secondary schools.

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Introduction

Biology, in particular is central to many of the scientific fields of human endeavours and its teaching should be given a serious attention. The study of Biology helps in the appreciation and enjoyment of nature and life. In addition, it prepares students for professional careers in such fields, as, medicine, bio-technology, agriculture and pharmacy. Biology is the science which studies living things and concerns itself with the study of the structure, behaviour, distribution, the origin of plants and animals and their relationship with their environments.

Biology is offered at the Senior Secondary School (senior secondary school One (S.S.S 1) to senior secondary school three (S.S.S 3) classes) as a single subject. This group of students must have offered Basic Science and Technology at the Junior Secondary School (J.S.S 1 – 3) which is aimed at preparing them for core science subjects at the Senior Secondary level.

Evidences have shown that students are not doing well in Biology at both West African Secondary School Certificate Examination (WASSCE) and National Examination Councils Secondary School Certificate Examination (NECO/SSCE). In Ekiti State, the average performance of students at credit level and above in Biology from 2015 to 2019 was less than 49%. Reports have shown that the Senior Secondary School Biology results in WASSCE and NECO SSCE in the last five years (2015-2019) in Nigeria were generally not encouraging. In 2015, 2016, 2017, 2018 and 2019 only 41.10%, 43.02%, 42.61%, 46.19% and 45.02% respectively, obtained credit pass and above in Biology. The same trend of low performance was reported in NECO/SSCE Biology results for Nigeria from 2015 to 2019. In 2015, 2016, 2017, 2018 and 2019 only 49.81%, 50.04%, 49.44%, 49.11% and 50.81%, obtained credit and above in Biology. Similarly, the Senior Secondary School Biology results of Ekiti State between 2015 and 2019 were also generally not encouraging as the percentage of candidates that passed Biology at credit level and above in Ekiti State were below 49%.

Aside the performance of students, attitude could also be a measure of learning outcome of students. Attitude can be formed as a result of some opinion or by following examples of someone like parents, teachers, peer group and friends. Michael and Gwyneth (2015) defines attitude as the way a person behaves towards something that show how the person feel or think about something. Attitude is a learned pre-disposition or tendency on the part of an individual to respond positively or negatively to some object, situation, concept or another person. Attitude can be acquired through learning and can be changed through persuasion using variety of techniques (Sarmah & Puri, 2014). Attitude to Biology plays a crucial role in the teaching and learning of Biology. It affects students' performance in Biology. Usually, the way Biology is represented in the classroom and perceived by students, even when teachers believe they are presenting it in authentic and context dependent way stands to alienate many students from Biology. It appears that positive attitude to Biology could lead students to success in Biology.

This level of performance of students in Biology may likely be associated with the use of conventional method of teaching and students' attitude to Biology. Despite several researches advocating for the use of innovative methods, students' performance in Biology is still not encouraging. Therefore, researchers in Biology education have continually sought for better teaching methods that will enhance students' performance.

The quest to curtail the shortcomings of the conventional method used in teaching and learning of Biology led to the discovery of other innovative teaching methods, among which is the brain-based strategy. Brain-Based Learning instructional strategy is a learner-centered and teacher-facilitated strategy that utilizes learners' cognitive endowments. This instructional strategy is based on the structure and functions of the brain in different aspects such as learning, assimilating, thinking and remembering. Brain-Based Learning is defined as any teaching strategy that utilizes information about the human brain to organize how lessons

are constructed and facilitated with emphasis placed on how the brain learns naturally It is a method for developing creative solutions to problems. It is an open sharing activity which encourages all students to participate. Brain-Based Learning involves accepting the rules of how the brain processes, and then organizing instruction bearing these rules in mind to achieve meaningful learning (Duman, 2010; Duman, 2014).

The Brain-Based Approach displays how teachers can create environments for active learning, taking into account how the brain learns, which is critical for students' learning (Caine, et al., 2009). Learning, in brain, is a process which starts with the reception of incoming information by the sensory memory. The information is first sent to the thalamus. Then, it is either sent to the cortex for analysis and response, or sent to amygdala (short-term memory) for scanning and storing in the memory. Then the information is sent to hippocampus (long-term memory). In order for information to be conveyed from the short-term memory to the long-term memory, strategies such as repetition should be used (Huen & Chan, 2010). Since learning occurs in the brain in this way, learning environments should be designed in line with the brain-based learning principles. The brain-based learning involves acknowledging the brain's rules for meaningful learning and organizing teaching with those rules in mind.

Caine and Caine cited in Huen and Chan (2010) explained that, brain-based learning involves accepting the rules of how the brain processes and then organizing these rules/principles in mind to achieve meaningful learning. Caine and Caine (2002) define brain-based learning as recognition of the brain's codes for a meaningful learning and adjusting the teaching process in relation to those codes. The principles of brain-based learning propose that effective learning could occur only through practicing real life experiences. Learning becomes more expressive when the brain supports the processes in search of meaning and patterning. Accordingly, it enables the learners to internalize and individualize learning experiences. Therefore, it is essential that learners be encouraged to participate in the learning and teaching process actively and that teaching materials be chosen according to their learning preferences.

Thus, there is the need to look at the effects of using brain-based strategy to teach Biology, probably it could be promising to better performance in biology. Evidences abound that brain-based strategy could be used to effectively facilitate better performance in Biology. It appears that the conventional method does not give attention to individual differences. This study, therefore, is a response to this challenge, and it is aimed at investigating the effects of brain-based strategy on students' learning outcome in Biology.

The study examined the effects of brain-based strategy and conventional method on learning outcome of senior secondary school students in Biology in Ekiti State, Nigeria. The study specifically examined:

i. the difference between the academic performance of students exposed to brain-based strategy and conventional method before and after treatments; and
ii. the difference between attitudinal mean scores of students exposed to brain-based strategy and conventional method before and after treatment.

Research Hypotheses

The following null hypotheses were generated for this study.

1. There is no significant difference between the pre-test mean score of students in Biology exposed to brain-based strategy and conventional method.

2. There is no significant difference between the post-test mean score of students in Biology exposed to brain-based strategy and conventional method.
3. There is no significant difference in the attitudinal mean score of students exposed to brain-based strategy and conventional method before treatment.
4. There is no significant difference in the attitudinal mean score of students exposed to brain-based strategy and conventional method after treatment.

Research Method

This study adopted a pre-test, post-test, control group quasi experimental design in which two groups (one experimental group and one control group) was involved. The homogeneity of the groups was established by pre-test while post-test was used after the treatment to measure learning outcomes (academic performance and attitude). The population of the study comprised of all S.S.S. 2 students offering Biology in all the public secondary schools in Ekiti State, Nigeria. The sample consisted of class intact size (139 students offering Biology) drawn from 6 public secondary schools in Ekiti State. The sample was selected using multistage sampling procedure.

Two instruments tagged Performance Test in Biology (PTB) and Biology Attitudinal Scale (BAS) were used for collecting the data for the study. PTB was used to measure students' performance in Biology. It consists of Sections A and B. Section A sought for the bio-data of the respondents which include the name of the school, identification number, school location and gender. Section B of PTB consisted of 30 objectives items with four options. The PTB was used for both pre-test and post-test for data collection. Biology Attitudinal Scale (BAS) investigated the affective domain of the students in Biology. The instrument consists of Sections A and B. Section A sought student's personal information while Section B consisted of 25 items covering the disposition of the students to Biology. The items are rated on a 4-point Likert Scale: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

The face and content validity of the instrument was ensured by experts of Tests and Measurement and Biology Education. To carry out the research in the schools, the researcher obtained permission from the authorities of the six schools. The study was carried out in three phases namely pre-treatment stage, treatment Stage, and post-treatment stage**.** The data collected through the instruments were analysed using descriptive and inferential statistics. Hypotheses 1 - 4 were tested using t-test at 0.05 level of significance.

Results

Hypothesis 1: There is no significant difference between the pre-test mean score of students in Biology exposed to brain-based strategy and conventional method.

Table 1: t-test Analysis for difference in the performance of students in Biology exposed to brain-based strategy and conventional method before treatment

Variations	**N**	**Mean**	**SD**	**df**	**t_{cal}**	**P**
Brain-based	71	10.21	2.18	137	1.350	0.319
Conventional	68	9.73	2.01			

P>0.05

Table 1 shows that the t-cal value of 1.350 was not significant because the P value of 0.319 was greater than 0.05 level of significance. This implies that null hypothesis is not rejected. Therefore, there is no significant difference between the pre-test mean score of students in Biology exposed to brain-based strategy and conventional method. The implication of this finding is that the students exposed to brain-based strategy and conventional method were homogeneous at the commencement of the study.

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Hypothesis 2: There is no significant difference between the post-test mean score of students in Biology exposed to brain-based strategy and conventional method.

Table 2: t-test Analysis for difference in the performance of students in Biology exposed to brain-based strategy and conventional method after treatment

Variations	N	Mean	SD	df	t_{cal}	P
Brain-based	71	24.84	4.09	137	12.797*	0.000
Conventional	68	16.72	3.37			

*P<0.05

Table 2 shows that the t-cal value of 12.797 was significant because the P value of 0.000 was less than 0.05 level of significance. This implies that null hypothesis is rejected. Therefore, there is significant difference between the post-test mean score of students in Biology exposed to brain-based strategy and conventional method. Students exposed to brain-based strategy performed better than the students exposed to conventional method with a mean difference of 8.12.

Hypothesis 3: There is no significant difference in the attitudinal mean score of students exposed to brain-based strategy and conventional method before treatment.

Table 3: t-test Analysis for difference in the attitude of students towards Biology exposed to brain-based strategy and conventional method before treatment

Variations	N	Mean	SD	Df	t_{cal}	P
Brain-based	71	51.76	2.54	137	1.827	0.081
Conventional	68	50.99	2.43			

P>0.05

Table 3 shows that the t-cal value of 1.827 was not significant because the P value of 0.081 was greater than 0.05 level of significance. This implies that null hypothesis is not rejected. Therefore, there is no significant difference in the attitudinal mean score of students exposed to brain-based strategy and conventional method before treatment.

Hypothesis 4: There is no significant difference in the attitudinal mean score of students exposed to brain-based strategy and conventional method after treatment.

Table 4: t-test Analysis for difference in the attitude of students towards Biology exposed to brain-based strategy and conventional method after treatment

Variations	N	Mean	SD	Df	t_{cal}	P
Brain-based	71	83.51	2.65	137	64.822*	0.000
Conventional	68	55.68	2.41			

*P<0.05

Table 4 shows that the t-cal value of 64.822 was significant because the P value of 0.000 was less than 0.05 level of significance. This implies that null hypothesis is rejected. Therefore, there is significant difference in the attitudinal mean score of students exposed to brain-based strategy and conventional method after treatment.

Discussion

The findings of the study revealed that students exposed to brain-based strategy and conventional method were homogeneous at the commencement of the study but there was improvement in performance of students exposed to brain-based strategy after intervention. There was significant difference between the post-test mean score of students in Biology exposed to brain-based strategy and conventional method. This finding is in line with the findings of Duman (2010), Akyurek and Afacan (2013), and Yagcioglu (2014) as they concluded that brain-based teaching strategy significantly impact students' performance in science.

It was also revealed that there was no significant difference in the attitudinal mean score of students exposed to brain-based strategy and conventional method before treatment while there was improvement after intervention for students exposed to brain-based strategy. This finding is in consonance with the findings of Saleh (2011), Yagcioglu (2014), and Seyihoglu and Kaptan (2012) as they concluded that brain-based strategy significantly impact students' attitude toward learning challenging science content.

Conclusion and Recommendations

Based on the findings of this study, it was concluded that, brain-based strategy was more effective and reliable than the conventional method in exhibiting students' performance in and attitude towards Biology. Therefore, brain-based strategy should be incorporated as a strategy of teaching Biology in secondary schools. The employer of Biology teachers should expose them to appropriate workshop on the use of brain-based strategy.

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An Analysis of Students' Academic Performance in School – Based Assessment and Certificate Examinations in General Mathematics, Physics and Computer Science in Ondo state, Nigeria

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Abstract:

In education, the phrase assessment refers to the wide range of methods and tools that educators use to assess, measure, and document students' academic readiness, learning progress, skill development, and educational needs. There are mainly two methods of assessment in Nigerian schools; viz: School-Based Assessment (SBA) and external examinations. The purpose of this research is to see if SBA has an impact on the final examination grades in secondary schools Mathematics, Computer Science and Physics in Ondo State, Nigeria. The researchers employed an ex-post-facto study design to accomplish this. This study used the results of students who took the West African Senior School Certificate Examinations (WASSCE) in the 2019/2020 academic year. As a result, the study's population comprised all 2,674 Senior Secondary School students who graduated from all the public senior secondary schools in Akoko South West Local Government Area of Ondo State during the 2019/2020 academic year. The instrument for data collection was the profoma tagged "Instrument of Comparative Performance in School – Based Assessment and External Examination (ICSPSBAEE)". The study's sample comprised 150 students who were chosen at random and in clusters for the study. Three research questions and three research hypotheses guided the study overall. The research questions were addressed using descriptive statistic such as mean and standard deviation, and the hypotheses were tested using SPSS version 20's One-Way Analysis of Variance (ANOVA) at the 0.05 alpha level. The study's findings revealed among others; that students in the researched area of Ondo State performed well in both SBA and

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external examinations in Mathematics, Computer Science and Physics assessments. In all the subjects under investigation, the results revealed a statistically significant difference in the scores of the three types of Assessments. Following the findings, it was suggested that SBA be promoted and made mandatory in all secondary schools; that school administrators ensure that mathematics, Computer Science and Physics syllabi are thoroughly covered; using WAEC and NECO/SSCE as benchmarks, and that Performance in School-Based Evaluation is included in the grading and assessment framework of external exterminations.

Keywords: Comparative Analysis, Academic Performance, School – Based Assessment, Certificate Examinations, Computer Science,

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Introduction

Basic and Post-Basic Education, as well as Career Development are part of Nigerian secondary school education (the Federal Republic of Nigeria, 2014). Three (3) years of Junior Secondary School, known as Basic Education, and three (3) years of Senior Secondary School, known as Post-Basic Education and Career Development, make up this level of education. While Basic Education is the sort of education a child receives immediately following primary school, Post-Basic Education is the type of education a child receives after passing the Basic Education Certificate Examination (BECE). Students are specifically prepared for the principal aim of secondary education, which is to progress to tertiary education after passing the West African School Certificate Examination (WASSCE) or the National Examination Council (NECO) as the case may be, at Post-Basic Education. As a result, an assessment is one of the most reliable instruments for identifying who advances from one level of school to the next, which is one of the reasons why assessment is seen as such an important component of secondary education in Nigeria.

Assessment in education, according to Odinko (2014), is the systematic process of capturing and analyzing empirical data on knowledge, skill, attitudes, and beliefs in order to evaluate programs and enhance students' learning. Assessment, according to Perry (2013), is the process of determining the importance, significance, or worth of teaching and learning. Assessment data can be derived directly from analyzing students' work to assess learning outcomes, or it can be based on other data from which learning inferences can be drawn. Odinko (2014) also defined assessment as the process of monitoring, recording, and documenting what students do and how they do it in order to take a variety of educational decisions that will have an impact on the student. As a result, assessment refers to the process of converting measuring data into understandable formats to facilitate decision-making. Assessment is therefore an important part of school instruction since it helps teachers identify whether or not students are meeting their educational goals. The assessment also has an impact on grading, placement, progression, instructional needs, curriculum, and, in some cases, funding. Many countries have adopted two major levels of assessment, namely School-Based Evaluation and certificate examinations, in recognition of the importance of assessment in the educational system.

School-Based Assessment is comprehensive, systematic, continuous, diagnostic, and integrative, as guided by the instructor, in addition to the preceding features. This evaluation technique evolved from a classroom setting that required active participation and involvement from students, with a focus on learning rather than grades and scores (Aduloju 2016). School-Based Assessment entails assessing students on a regular basis in the three domains of learning (cognitive, affective, and psychomotor) using a variety of tools such as tests, assignments, observations, interviews, questionnaires, and projects.

Certificate examinations are the second type of assessment. This form of assessment is used to issue a certificate that indicates an examinee's mastery level. The Certificate / external examination is a type of examination that is conducted by professionals outside of the examinee's school, college, or university. Certificate examinations are assessments that are arranged and given by organizations outside the examinee's institution. Because it is external and produces a summative rating of candidates, individual schools have no control over it (Tarnum et al, 2016).

External examinations are conducted in modern Nigeria by indigenous examination bodies such as the West African Examinations Council (WAEC), which administers the West African Senior School Certificate Examination (WASSCE), and the National Examination Council (NECO), which is in charge of administering the Senior School Certificate Examination (SSCE). The National Business

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and Technical Examination Board (NABTEB), administers the National Technical Certificate (NTC) and National Business Certificate (NBC) examinations, and the Joint Admission Matriculation Board (JAMB), which administers the Universities Matriculation Examinations (UME), are two other external examination bodies in the country. The focus of this research is solely on the WASSCE and NECO examinations, which are administered at the end of the secondary school year.

The analysis of student's performance in Mathematics, Computer Science and Physics in the West African Senior School Certificate Examination (WASSCE) May/June results in Nigeria from 2007 to 2016 revealed both poor enrolment and performance as shown below:

Table 1: Candidates' Enrolment and Performance in WASSCE in Mathematics, Computer Science and Physics between 2007 and 2016

Year	MATHEMATICS			COMPUTER SCIENCE			PHYSICS		
	TOTAL SAT	Credit Passed (A1 – C6)	%	TOTAL SAT	Credit Passed (A1 – C6)	%	TOTAL SAT	Credit Passed (A1 – C6)	%
2007	1,238,163	413,211	33.37	424,747	196,063	46.16	409,449	180,797	44.16
2008	1,259,964	427,644	33.94	456,980	202,762	44.37	408,237	200,345	49.08
2009	1,259,964	453,928	33.87	456,980	203,365	43.49	444,236	222,722	50.14
2010	1,300,418	427,644	32.88	465,643	263,059	50.70	463,755	237,756	51.27
2011	1,505,199	579,432	38.50	565,692	280,250	49.54	563,161	360,096	63.94
2012	1,646,150	587,044	35.66	627,302	270,570	43.13	624,658	429,415	68.74
2013	1,648,363	852,717	51.73	639,296	462,517	72.34	637,023	297,988	46.77
2014	1,365,384	766,971	56.17	636,268	397,649	62.49	635,729	386,270	60.76
2015	1,390,234	798,246	57.42	680,357	412.323	60.60	684,124	410,543	60.01
2016	1,200,367	740,345	61.68	706,873	408,122	57.74	705,125	415,655	58.95

Source: Statistics Section of the WAEC Office Yaba, Lagos (2017).

However, an analysis of candidates' performance in Mathematics, Computer Science and Physics and in the West African Senior School Certificate Examination (WASSCE) May/June results in Ondo State from 2015 to 2019 revealed that there was no specific pattern in students' performance in the three science subjects under investigation, and the trend in performance did not follow any pattern. Table 2 shows the enrolment and performance of Mathematics, Computer Science and Physics in WASSCE in Ondo State from 2015 to 2019.

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Table 2: Candidates' Enrolment and Performance in WASSCE in English Language and Computer Science: 2015-2019.

YEAR	Subject	No. Reg.	A1 – C6 (%)	D7 – F9 (%)
2014/15	Mathematics	6691	3974 (59.4)	2117 (40.6)
	Computer Science	6072	4580 (75.4)	1492 (24.6)
	Physics	6069	2863 (47.2)	3206 (52.8)
2015/16	Mathematics	6022	4730 (78.5)	1292 (21.5)
	Computer Science	5189	4403(84.9)	786 (15.1)
	Physics	5231	4173 (79.8)	1048 (20.2)
2016/17	Mathematics	5641	4453 (78.9)	1188 (21.1)
	Computer Science	5258	4894 (93.1)	364 (6.9)
	Physics	5250	2724 (51.9)	2526 (48.1)
2017/18	Mathematics	5578	4637 (83.1)	941 (16.9)
	Computer Science	5155	3964 (76.9)	1191 (23.1)
	Physics	4989	4322 (86.6)	667 (13.4)
2018/19	Mathematics	5563	3922 (70.5)	1641 (29.5)
	Computer Science	5034	3878 (76.9)	1161 (23.1)
	Physics	5014	3386 (67.5)	1628 (32.5)

Source: Statistics Section of the WAEC Office Yaba, Lagos (2020).

Statement of the Problem

School-Based Assessment (SBA) and external examinations have been the two modalities of assessment of students' performance in secondary schools in Nigeria's educational system. Odinko (2014), Asuru (2017), Grina (2012), and Anthony (2018) have all demonstrated the pros and disadvantages of each of these assessment approaches. It is also advised that a student's School-Based Assessment scores in any subject mirror his or her performance on external tests.

Obviously, some researchers, such as Opara, Onyekuru, and Njoku (2015), looked into School-Based Assessment scores as predictors of students' final grades in Rivers and Delta states, respectively, and discovered that School-Based Assessment scores predicted students' performances in JSSCE Physics and integrated science. Tarnum, Obinne, and Achulogy (2016) conducted a comparative analysis of students' mean performance in School-Based Assessment and certificate exams in Benue state and found that the students did well in both School-Based Assessment and external examinations as evidenced in WASSCE and NECO. Other studies have discovered that students' School-Based Assessment scores are much higher than their certificate test scores.

Most studies in this area, to the best of this researchers' knowledge, were conducted in other regions of the country and have not been conducted in secondary schools in Ondo State in recent times. Furthermore, these scholars were not interested in Mathematics, Computer Science and Physics. In the light of the preceding, a more critical investigation with more current data is required to obtain current empirical facts on the mean performance of students in Ondo state secondary schools in School-Based Assessment and external examinations in Mathematics,

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Computer Science and Physics. As a result, the researchers decided to conduct an analysis of students' performance in School-Based Assessments and certificate examinations in Mathematics, Computer Science and Physics at senior secondary schools in Ondo State to see if there is a difference in students' mean performance in 2018/2019 School-Based Assessments and external examinations (WAEC and NECO).

Research Questions

The study was guided by the following research questions:

1. What are the mean students' scores in Mathematics School-Based Assessments and external examinations?
2. What are the mean students' scores on school-based assessments and external computer science examinations?
3. What are the mean students' scores in Physics School-Based Assessment and external examinations?

Research Hypotheses

The following null hypotheses were developed and evaluated at the 0.05 significance level.

1. There is no significant difference between the mean scores of students in School-Based Assessment and External Examinations in Mathematics.
2. There is no significant difference between the mean scores of students in School-Based Assessment and External Examinations in Computer Science.
3. There is no significant difference between the mean scores of students in School-Based Assessment and External Examinations in Physics.

Literature Review

The term assessment is used in education to describe the vast range of methods and resources that educators employ to evaluate, measure, and document students' academic preparedness, learning progress, skill acquisition, and educational needs. It is the methodical foundation for drawing conclusions regarding a student's learning and development. The process of defining, developing, choosing, collecting, analyzing, interpreting, and applying the information to improve student's learning and development is referred to as assessment. Hence assessment, on the other hand, is a means to an end rather than an end in itself. Assessment is used for a variety of reasons, including decision-making at the primary, secondary, and tertiary levels (Ijaya, 2002). Assessment is the methodical gathering of data that provides information about an individual (Okwudire, 2005). There are various degrees of student evaluation. For example, Folajogun (2012) divided assessments into three categories, viz: school-based, public examinations, and international evaluations. Class teachers conduct School-Based Assessments (SBA) in the classroom. School-Based Assessment/ Evaluation, according to Omole & Akawu (2013), is a continuous assessment that takes place on the school grounds under the full supervision of the teacher. It is the evaluation that is planned, managed, and administered by a school's teachers. Classwork, assignments, weekly and monthly tests, field trip reports, laboratory experiment reports, and terminal and annual examinations are all part of this type of assessment.

The external or certificate examination is a type of evaluation that is done with the goal of issuing an external certificate showing the examinee's degree of mastery. (www.merriam-

webster.com/dictionary) An external examination is one that is organized by someone outside of a student's own school, college, or university. The external examination is a type of evaluation that is organized and delivered outside of the institution. They are independent of school control and produce summative candidates' evaluations. The primary difference between School-Based Assessment and External Examination therefore, is that the former is prepared, administered, and interpreted by students' teachers, whilst the latter is not under their direct supervision. Regardless of the differences, it is expected that the scores earned by students in School-Based Assessment will match the scores acquired by the same candidates in External Examination in the same disciplines. If this assumption is correct, the following question may arise: are candidates' scores in external examinations the same as in school-based assessments? In Nigeria, certification assessment is external at the primary and secondary school levels, but it is school-based at the tertiary level, although it is regulated by sister institutions.

External examinations began in Nigeria with the introduction of western education. Students were certified after completing each school level of instruction through competency assessments (Adejoh & Obinne, 2013). This resulted in the first school leaving external (FSLC) for primary school leavers and external examinations for secondary school leavers conducted by select external entities. Cambridge University, London University, City and Guilds of London; Royal Society of Arts; and Institute of Chartered Accountants of Nigeria (ICAN), organized some of the external examinations. At the regional and national levels, indigenous examination bodies gradually emerged. The West African Examinations Council (WAEC) administers the West African Senior School External Examination (WASSCE), and the National Business and Technical Examinations Board (NABTEB) administers the National Technical Certificate (NTC) and National Business Certificate (NBC) examinations, as well as the advanced level versions in the following trades/disciplines. Other bodies include the National Examinations Council (NECO), which oversees the administration of Senior School External Examinations, as well as General Education, Business Trades, Engineering/Construction Trades, and Miscellaneous Trades (http://www.nabtebnigeria.org/nabteb-in-brief/) (SSCE). All of these Senior Secondary School External examinations are taken at the end of the Senior Secondary School educational programme, hence they are not school-based, but rather conducted outside.

The majority of Continuous Assessment studies are either correlational, comparative, or predictive in nature. Ukwuije (2013), for example, employed the Pearson Product Correlation Coefficient to determine the predictive strength of JAMB scores, SCE outcomes, and periodic assessment scores on students' end-of-semester performance. Periodic evaluation scores had the strongest predictive power of the factors studied, according to the study. The data revealed that periodic evaluation procedures are very efficient gauges of academic achievement; certificate worth and outcomes of entry examinations were not significantly connected to end-of-semester performance.

Ibe (2012) looked at the relationship between JAMB exam outcomes and first-year university exam results. According to the findings, JAMB scores in Physics, Chemistry, and Economics were highly connected with university marks in the same courses, however, JAMB scores in Computer Science and Geography were not. Hassan and Adeyanju (2018) investigated the predictive validity of SSCE performance in 13 secondary schools in Nigeria. The majority of Secondary Schools exhibited no significant association between Continuous Assessment scores in English and Basic Science, according to the study. There was, however, a substantial link between student gender and the

predictive validity of interview test scores for university admission. In Agricultural Science, Computer Science, English Language, and Geography, interview test scores are predictive indicators for Bachelor's degree accomplishment, however, in Basic Science, there was no significant link between interview test scores and Bachelor's degree achievement. Aliyu and Ngadda (2000) used the College of Education, Gashua as a case study to investigate the relationship between formative and summative evaluation scores. The study also discovered that the formative and summative evaluations of the subjects studied have a substantial positive link. The findings backed up the claim that formative evaluation scores are effective predictors of end-of-semester exam marks. In Rivers and Delta states, respectively, Opara, Onyekuru, and Njoku (2015) investigated School-Based Assessment scores as predictors of students' final grades and discovered that School-Based Assessment scores predicted students' outcomes in JSSCE Physics and integrated science. Tarnum, Obinne, and Achulogy (2016) compared students' mean performance in School-Based Assessment and certificate exams in Benue state and discovered that students performed well in both School-Based Assessment and external tests, as demonstrated by WASSCE and NECO results.

According to the research examined, School-Based Assessment is used in practically all Nigerian schools. This means that the current study follows the standard procedures in all schools. According to the literature, the teacher is the primary implementer of School-Based Assessment, which is also supported by this research. Almost all of the literature reviewed by the researchers is correlative, predictive, or comparative, whereas this study is experimental, making it unique and significant. Some studies have found a positive association between exam scores, while others have found a negative correlation. As a result, the goal of this study is to see if School-Based Assessments have an impact on final exam marks in Mathematics, computer science and Physics in secondary schools in Ondo State, Nigeria.

Methodology

Ex-post facto research design was used in this study. This is because it was designed to look into the academic accomplishment of students in Ondo State in Mathematics, Computer Science and Physics. The study's population was all the 2,674 Senior Secondary School students who graduated during the 2019/2020 academic year from all public senior secondary schools in Akoko South West Local Government Area of Ondo State. One hundred and fifty (150) students were chosen for the study from five (5) public senior secondary schools in Akoko South West Local Government Area of Ondo State. The five schools were chosen using a cluster selection technique, while the 150 subjects for the study were drawn using a simple random sampling technique. Each of the five public secondary schools had thirty (30) pupils sampled. A proforma named "Instrument of Comparative Students' Performance in School-Based Assessment and External Examination (ICSPSBAEE)"; was used to collect data. The instrument was developed by the researchers and was used to collect data on the performance (scores/grades) of selected candidates in the listed subjects (Mathematics, Computer Studies and Physics) of their annual results while in Senior Secondary School II (SSII) during the 2018/2019 session; in order to create School-Based Assessment scores. The same instrument was used to collect data on the same students' performance in the listed subjects in WASSCE (WAEC) and SSCE (NECO). Students' WASSCE and SSCE (NECO) grades were converted to raw scores as shown in the table below:

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Table 3: WASSCE and SSCE (NECO) Scores and their weights

A1	B2	B3	C4	C5	C6	D7	F9
7.0	6.0	5.0	4.0	3.0	2.0	1.0	0.0

WASSCE and SSCE (NECO) are standardized examinations that are guaranteed to be valid and reliable, and so their results, which are categorized as secondary data, are valid and reliable. As a result, the data for this study came from SBA results and examinations conducted by External Examination Bodies. The data was analyzed using SPSS version 20 using the descriptive and inferential statistic. The research questions were specifically answered using mean and standard deviation. Because the pass standard is 45 and above, any mean obtained equal to or greater than 45.0 was deemed a satisfactory performance, while any mean received below 45.0 was considered poor. At the 0.05 level of significance, Analysis of Variance (ANOVA) was conducted to see if there was any significant difference between the students' performances in School-Based Assessments and external examinations.

Results and Discussions

Research Question 1: What are the mean students' scores in Mathematics School-Based Assessments and external examinations?

Table 4: Descriptive statistics of performance of students in Mathematics

Subject Area	Exam Type	N	Mean	Std. Deviation
Mathematics	WAEC	150	61.14	6.90
	NECO	150	53.28	5.71
	SBA	150	57.09	9.79

The mean scores of students in the School-Based Assessment, WAEC, and NECO in Mathematics are shown in Table 4. It should be emphasized that the average scores on all three exams (SBA, WAEC, and NECO) was greater than 45.0. This demonstrates that students in the investigated area did well in Mathematics in SBA and external assessments. Even though WAEC had the highest performance, the results suggest that SBA (9.79) had the highest variability of scores, followed by WAEC (6.90), and NECO had the lowest variability of scores (5.71). This implied that the scores with the best spread was SBA, followed by WAEC and lastly by NECO.

Research Question 2: What are the mean students' scores on school-based assessments and external computer science examinations?

Table 5: Descriptive statistics of performance of students in Computer Sci

Subject Area	Exam Type	N	Mean	Std. Deviation
Computer Science	WAEC	150	58.31	9.17
	NECO	150	55.79	5.38
	SBA	150	69.81	11.27

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The study's findings, as shown in Table 5, show that students in Computer Science performed well on the mean in SBA, WAEC, and NECO. It should be emphasized that the mean scores for all three forms of assessment were above 45.0. This demonstrates that students in the study area in Ondo State did well in Computer Science in all three exams. SBA had the highest score variation (11.27), followed by WAEC (9.17), while NECO had the lowest (5.38). This implied that the scores of the SBA also had the best spread, followed by WAEC and then by NECO.

Research Question 3: What are the mean students' scores on school-based assessments and external physics examinations?

Table 6: Descriptive statistics of performance of students in Physics

Subject Area	Exam Type	N	Mean	Std. Deviation
Physics	WAEC	150	48.27	7.62
	NECO	150	58.19	7.38
	SBA	150	49.43	13.22

The outcome from Table 6 displays the mean scores of students in physics across the School-Based Assessment, WAEC, and NECO. It should be emphasized that the average scores for all three exams (SBA, WAEC, and NECO) exceeded the benchmark of 45.0. This suggests that students in the researched area did well on the three exams in Physics. Students' scores varied the most in SBA (13.22) and NECO (7.38) while WAEC had the least variation (7.62) in Physics scores. This suggested that the SBA scores continued to have the best spread.

Test of Hypotheses

Hypothesis 1: There is no significant difference between the mean scores of students in School-Based Assessment and External Examinations in Mathematics.

To test this null hypothesis, the One-Way between-groups Analysis of Variance (ANOVA) was used to see if there was a significant difference between the mean scores of students in School-Based Assessment and External Examinations in Mathematics.

Table 7: Analysis of variance (ANOVA) of scores of students in Mathematics

	Sum of Squares	Df	Mean Square	F	Sig
Between Group	241.378	2	120.689	53.937	.000
Within Group	5425.400	148	30.652		
Total	**5666.778**	**150**			

p>0.05

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The result in table 7 indicated that there was a statistically significant difference at the p<0.05 in the scores of the three modes of Assessments: F=53.937, P= .000. Hence, the null hypothesis was not upheld.

Hypothesis 2: There is no significant difference between the mean scores of students in School-Based Assessment and External Examinations in Computer Science.

To test this null hypothesis, the One-Way between-groups analysis of variance (ANOVA) was used to see if there was a significant difference between the mean scores of students in School-Based Assessment and External Examinations in Computer Science.

Table 8: Analysis of variance (ANOVA) of scores of students in Computer Science

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig**
Between Group	28421.228	2	14244.328	97.251	.000
Within Group	71554.237	148	95.338		
Total	**99975.465**	**150**			

p>0.05

The result in table 8 indicated that there was a statistically significant difference at the p<0.05 in the scores of the three modes of Assessments: F=97.251, P= .000. Hence, the null hypothesis was not upheld.

Hypothesis 3: There is no significant difference between the mean scores of students in School-Based Assessment and External Examinations in Physics.

To test this null hypothesis, the One-Way between-groups Analysis of Variance (ANOVA) was conducted to explore whether there was no significant difference between the mean scores of students in School-Based Assessment and External Examinations in Physics.

Table 9: Analysis of variance (ANOVA) of scores of students in Physics

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig**
Between Group	1608.133	2	3217.227	63.482	.000
Within Group	2486.417	148	49.185		
Total	**4094.550**	**150**			

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p>0.05

The result in table 9 indicated that there was a statistically significant difference at the p<0.05 in the scores of the three modes of Assessments: F=63.482, P= .000. Hence, the null hypothesis was not upheld.

Discussion of Findings

The study's findings revealed that students in the investigated area fared well in both SBA and external Mathematics, Computer Science and Physics assessments. This finding is in contrast to Gani & Attah (2013), who claimed that teachers do not adhere to the qualities of SBA, preventing it from being comparable to external assessments. They claimed that teachers merely utilize SBA to help pupils prepare for external examinations. If the mean external examination performance and SBA performance are both above the benchmark, it indicates that teachers in the investigated area are effectively using SBA to monitor teaching and learning. Despite the fact that the students did well in all of the examinations, the research revealed that the SBA had a consistently higher variability of marks than the external exams. This is in line with Monday, Ikiroma, and Nwogwugwu (2014), who believe that class teachers are the best people to judge whether or not students have mastered the content. This study's findings are similar to those of Opara, Onyekuru, and Njoku (2015), who discovered that students' performance in Physics and Integrated Science was predicted by School-Based Assessment scores.

In a similar vein, Tarnum, Obinne, and Achulogy (2016) discovered that students performed well in both School-Based Assessments and external examinations, as shown by WASSCE and NECO results. This could also be explained by the fact that the external examination results were the midpoints of the grade ranges achieved by the sampled students. This could explain the limited variability in the score spread that was observed. The students investigated in the three Examinations performed better than the benchmark of 45.0 in Computer Science. This demonstrated that the students did well in the SBA, WASSCE, and NECO/SSCE examinations. This was in contrast to Nworgu's (1992) assertion that teacher-made test items are of poor quality and that SBA is merely used to prepare pupils for WASSCE and NECO/SSCE. If the teacher-made materials were not up to par, as Nworgu (1992) claimed, it would have had a negative impact on the students' performance. The study also discovered that in the three examinations (WASSCE, NECO / SSCE, and SBA) in the area of Ondo State under inquiry, there was a statistically significant variation in the mean scores of students in Mathematics, Computer Science and Physics.

Conclusion

The study has been able to establish the comparison between students' academic performances in School-Based Assessment and External Examination in SSCE examination in Ondo State, Nigeria. The study concluded that the mean scores of students in Mathematics, Computer Science and Physics in the three tests (WASSCE, NECO / SSCE, and SBA) in Ondo State were statistically significant. Secondary schools in the area also performed well in both school-based and external assessments. Through School-Based Assessment, the students are adequately prepared for their External Examinations.

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Recommendations

The recommendations hereunder are provided based on the findings of this study:

1. The academic standards set by state teachers to achieve high academic standards should be maintained.
2. Performance in School-Based Evaluation should be included in the grading and assessment framework of external exterminations, as is frequently recognized in policy documents.
3. Students should be given extensive opportunities to study past external examination questions while still in school so that they are familiar with them.
4. Teachers should receive extensive training in the methods for designing, conducting, and interpreting school-based examinations that meet the same standards as external examinations.
5. Government should provide educational facilities and learning materials, particularly laboratory equipment, to suit the demands of students studying computer science and Physics theory and practical exercises.
6. Teachers' abilities and methodologies should be improved in order to increase Mathematics, computer science and Physics learning in schools.
7. School administrators should guarantee that Mathematics, Computer Science and Physics syllabi are thoroughly covered, using WAEC and NECO SSCE as benchmarks, with proper encouragement and monitoring of teachers.
8. School-Based Assessment should be promoted and made mandatory in all secondary schools, particularly in core disciplines such as English and Mathematics.
9. Teachers should make efforts to conduct regular school-based assessments for students, right from JSS 1.

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Barriers to Covid-19 Vaccine Acceptance Among Health Workers

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Abstract:

COVID-19 (the popular name for the Coronavirus Disease 2019), is a disease of the respiratory system caused by the Severe Acute Respiratory Syndrome, Corona Virus-2 (SARS-CoV-2), and it was declared a pandemic by the World Health Organization on the 11th of March, 2020. Frantic efforts have been put in place by the local, state and federal government to curb the spread and effect of covid-19 pandemic with the use of vaccines. Rather than being celebrated, the eventual discovery of systems of vaccination against COVID-19 pandemic was otherwise greeted with pessimism, causing attrition and low uptake of the vaccines in some cultures, especially in African countries. The disease kept on spreading and causing havoc. Despite having a number of COVID-19 vaccines available and approved for public use, the uptake appears to be low. Some of the reasons for this low uptake may include level of trust in the healthcare system, educational background, presence of conspiracy theories, social, traditional and religious beliefs, social media, fear of adverse side effects, personal risk perception. This paper recommends that the government should create more awareness about COVID-19 vaccination and make available the trials which the vaccines had gone through to health workers so as to convince them on the acceptance of the vaccines.

Keywords: Acceptance, Barriers, COVID-19, Health Workers Vaccine,

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Introduction

The COVID-19 is the fifth reported pandemic in history since the 1918 Spanish flu, which is also known as the 1918 influenza pandemic (Liu *et al.,* 2020). The Spanish flu was caused by the H1N1 Influenza A Virus between February 1918 and April 1920.In four successive waves, about 500 million people (about 33% of the world's population at that time) were affected. There was a second wave of COVID-19 worldwide, despite all the efforts and preventive measures put in by the affected Nations of the world (Allagoa *et al.,* 2021). The third wave is presently ongoing in France, Spain and Germany. The strain of the COVID-19inIndiaappearstobemorevirulent as it has been associated with more morbidity and mortality. The prevalence of COVID-19 in Nigeria is 12.2%, with a recovery rate of 82%, and a case fatality rate of 1.2%. To prevent a similar death toll of the 1918 flu, the world population will have to be vaccinated against COVID-19 (Amaze *et al.,* 2021).

The prevalence of COVID-19 in Nigeria is 12.2%, with a recovery rate of 82%, and a case fatality rate of 1.2%. In order to prevent a similar death toll of the 1918 flu, the world population will have to be vaccinated against COVID-19 (Amaze *et al.,* 2021)

Corona viruses are zoonotic i.e. the first develop in animal before being transmitted to humans. A person has to come into close contact with an animal that has the infection. once it develops in people it can be transmitted from person to person through respiratory droplets. The viral material hangs out in droplets and can be breathed into the respiratory tract (windpipe and lungs) where the virus can then lead to an infection. Man can also acquire SARS-COV-2 by touching the mouth nose or eyes after touching a surface or object that has the virus.

To test for the COVID-19 virus, a health care provider takes a sample from the nose (nasopharyngeal swab), throat (throat swab) or saliva. The samples are then sent to a laboratory for testing. If an individual is coughing up sputum, such can be sent for testing. The FDA has authorized at-home tests for the COVID-19 virus. These are available only with a doctor's prescription (WHO, 2022)

Overview of COVID-19 Vaccination

With everything slowing down or coming to a halt, scientists and health practitioners have delved into trying to find a permanent solution so that life can go back to its normal. Multi-agency efforts on research have been facilitated in pursuit of developing vaccines for immunization to prevent COVID-19 infection. These vaccines have different working mechanisms to protect individuals against the disease (Terefa, et al., 2021).

The research on finding a vaccine and improved detection for the disease have moved at an unprecedented pace for reasons such as advancement in research, increased innovative vaccine technology equipment, the human trial was done at an early stage, and lastly great unity between relevant bodies. There are various vaccines developed to protect people from the transmission and adverse effects of the virus. Preliminary data shows support for this statement as countries are reporting a decrease in the transmission rate (Mahmud, et al., 2021).

For instance, Israel claims to have vaccinated almost 75% of its older population, an action that has seen a 33% decrease in the transmission rate of the virus. That notwithstanding, the impact of COVID-19 vaccines on the transmission of the disease has not yet been fully determined. The Strategic Advisory Group of Experts (SAGE), through evidence-based medicine, gives temporary guidance on issues to do with immunization. Priority is given to health workers and people aged above 65 years because vaccines are limited and they also face a higher risk of getting infected.

Researchers across the world have been working assiduously to develop vaccines against the highly contagious virus. Approximately Sixty (60) COVID-19 vaccines candidates are undergoing clinical

evaluations, and another one hundred and seventy- two (172) COVID-19 candidate vaccines are at the preclinical evaluation stage as of December 29, 2020. It is believed that some of these vaccines will be ready for use by early 2021. However, there are widespread skepticism and divergent views regarding the legitimacy of various COVID-19 vaccines among people across the globe. The effectiveness of vaccination programs and the global objective of eradicating the pandemic require optimal acceptance of the vaccine across all countries. The success of any vaccination program is largely dependent on how well the vaccines are accepted among the population and the willingness of people to be vaccinated (WHO, 2022).

Vaccination is an effective way of combating infectious conditions. As of 26th March 2021, 83 vaccines were in the clinical development stage while 184 were at the pre-clinical development stage. Globally, several vaccines have been deemed safe and effective for human use, including Pfizer, Oxford/AstraZeneca, Moderna, Janssen, Sputnik V, Sinovac, and Sinopharm. Due to the inadequate supply of COVID-19 vaccines globally, governments have prioritized high-risk groups to receive the initial supply of vaccines (WHO, 2022).

The availability of COVID-19 vaccines may not translate into its uptake. Although governments will provide the vaccines, their uptake is voluntary. Indeed, several studies have demonstrated that not all health care workers are ready to accept COVID19 vaccines when made available in their country. For example, a study conducted in the Democratic Republic of Congo found that approximately 28 of health care workers were willing to receive the COVID-19 vaccine if available (Elkalmi, et al., 2021).

In response to the massive global effects of COVID-19, multiple laboratories worldwide are working to create an effective vaccine. The possibility that one will be available in 12 to 18 months is seen by many as the most promising means of controlling the COVID-19 pandemic. Over the past century, vaccinations have become a routine and effective preventive measure in reducing the rate of and eradicating or nearly eradicating certain viral illnesses. Besides providing direct immunity and preventing disease among vaccinated individuals 'vaccines have been shown to reduce infections even among individuals who are not vaccinated, through herd immunity, if a sufficient proportion of the population is immune.

Many pharmaceutical companies and research laboratories are currently working with messenger RNA, DNA, subunit, virus-like particles and viral vectors to discover an effective vaccine for the COVID-19 pandemic. On an unprecedented timeline, multiple vaccines have been developed and are currently being tested in large-scale phase 3 trials, suggesting that a vaccine may be available in the foreseeable future. The great potential of a vaccine against COVID-19 is tempered by rising vaccine skepticism in the United States and worldwide, which may present challenges to widespread vaccine uptake when a vaccine becomes available (Terefa, et al., 2021).

Available COVID-19 Vaccines

Some vaccines are presently available, and approved for public use. These vaccines include Oxford/AstraZeneca viral vector vaccine, Pfizer/BioNTech mRNA vaccine, Moderna RNA vaccine, Janssen/Johnson and Johnson viral vector vaccine, Sinopharm inactivated viral vaccine, Sinovac inactivated viral vaccine, Gamaleya viral vector vaccine, Bharat Biotech Inactivated viral vaccine (Covaxin) and Novavax Protein subunit vaccine (GAVI, 2021). To fight COVID-19, affordable vaccines need to be developed, and distributed across the world, and every individual needs to be vaccinated. According to the World Health Organisation, "no one is safe until everyone is safe." For this reason, COVAX was launched in 2020. Previously known as COVID-19 Vaccines Global Access Facility, COVAX is a worldwide initiative with the main objective to develop, manufacture and

distribute COVID-19 vaccines fairly and evenly around the world (Terefa, et al., 2021, Adedeji-Ademola, et al., 2022, Mahmud, et al., 2021).

COVAX is coordinated by the World Health Organization in collaboration with the Vaccine Alliance (Gavi) and the Coalition for Epidemic Preparedness Innovations (CEPI). In April 2020, ACT Accelerator was launched in partnership with the European Commission and France to fight the COVID-19pandemic. Apart from enhancing the production and worldwide distribution of the COVID-19 vaccines, COVAX funds the access to the COVID-19 vaccines for under-developed countries, thereby bridging the gap between the developed and under-developed Nations of the world.

The plan of COVAX is to provide two billion doses of various vaccines to 190 countries in the year 2021, ensuring vaccination of up to 20 percent of the world's population. The most important objective of COVAX is to send vaccines to 92 less-wealthy countries free-of-charge. Nigeria is one of these less-wealthy countries.

The Oxford–AstraZeneca COVID-19 vaccine, codenamed AZD1222, and sold under the brand names Covishield and Vaxzevria among others, is a viral vector vaccine for prevention of COVID-19. Developed by Oxford University and AstraZeneca, it is given by intramuscular injection, using as a vector the modified chimpanzee adenovirus ChAdOx1.Studies carried out in 2020 showed that the efficacy of the vaccine is 76.0% at preventing symptomatic COVID-19 beginning at 22 days following the first dose and 81.3% after the second dose. Another analysis showed that, for symptomatic COVID-19 infection after the second dose, the vaccine is 66% effective against the Alpha variant (lineage B.1.1.7), and 60% against the Delta variant (lineage B.1.617.2) (Alhassan, et al., 2021).

As of April 2021, WHO reported that 102 countries in six continents have received almost 38.4 million doses of COVID-19 vaccines through the COVAX facility, Nigeria received 3,924,000 doses of the Oxford/AstraZeneca COVID-19 vaccine through COVAX on March 2, 2021. Vaccination commenced at the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria on March 15, 2021. However, the turnout of hospital staff was low, necessitating extension of vaccination by three weeks. Therefore, this study was undertaken to access the reasons behind the low turnout of health workers for COVID-19 vaccination.

This vaccine works based on the virus's genetic instructions for building the spike protein. But unlike the Pfizer-BioNTech and Moderna vaccines, which store the instructions in single-stranded RNA, the Oxford vaccine uses double-stranded DNA. Adenoviruses are common viruses that typically cause colds or flu-like symptoms. The Oxford-AstraZeneca team use a modified version of a chimpanzee adenovirus, known as ChAdOx1. It can penetrate cells, but it cannot replicate inside them (Fowlkes, et al., 2021).

The Oxford-AstraZeneca vaccine for Covid-19 is more rugged than the mRNA vaccines from other companies. DNA is not as fragile as RNA, and the adenovirus's tough protein coat helps protect the genetic material inside. As a result, the Oxford vaccine does not have to stay frozen. The vaccine is expected to last for at least six months when refrigerated at 38–46°F (2–8°C) (The New York Times, 2021).

After the vaccine is injected into a person's arm, the adenoviruses bump into cells and latch onto proteins on their surface. The cell engulfs the virus in a bubble and pulls it inside. Once inside, the adenovirus escapes from the bubble and travels to the nucleus, the chamber where the cell's DNA is stored. The adenovirus pushes its DNA into the nucleus. The adenovirus is engineered so it cannot make copies of itself, but the gene for the coronavirus spike protein can be read by the cell and

copied into a molecule called messenger RNA, or mRNA. The mRNA leaves the nucleus, and the cell's molecules read its sequence and begin assembling spike proteins (The New York Times, 2021).

Pfizer has an active ingredient mod RNA that encodes the spike of SARS-Cov-2, the lipid hexane-6,1-diyl and salts such as potassium chloride, potassium phosphate and finally sucrose. Thirty-nine cases in BNT162b2 group and eighty-two (82) cases in placebo group were observed between the first and second doses. The vaccine efficacy was determined at 52% and 95 confidence intervals. Early protection was noticed from as early as 12 days after the first dose. Local and systemic reactions and use of medication was tested using data collected from 8,183 participants for 7 days after vaccination (El-Elimat, et al., 2021).

Pain at injection site was assessed basing on severity. Redness and swelling were also measured based on severity. Additional scales of measurement were fatigue, headache, chills, muscle and joint pain, vomiting and diarrhoea. Under local reactions, pain at the injection site was a key feature affecting both the below and above 55-year-olds irrespective of the dosage in those with BNT162b2. The participants in the placebo group however felt less pain at the injection site. Irrespective of age or type of dosage, in systemic reactions, fatigue was highest and vomiting lowest. Those with BNT162b2 had higher rates than those with placebo.

An observational study from Israel shows that Pfizer is 26% effective at preventing infection on people who have not been infected before, which is then boosted to 92% by the second shot. The vaccine is administered through an injection on the upper hand, and to be given to people above 16 years. Those with severe allergic reactions to any ingredient used in the manufacture of the vaccine or may experience an allergy after the first shot are advised not to take the vaccine. Clinical trials showed mild or moderate side effect that occurs within 7 days after getting the shot, with only a few getting severe side effects to the point of hospitalization or death. These include tiredness, swelling, muscle pain, nausea, etc (Terefa, et al., 2021).

Benefits of Receiving the Vaccine

Millions of people around the world have received COVID-19 vaccines since they were authorized for emergency use by FDA. COVID-19 vaccines have undergone and will continue to undergo the most intensive safety monitoring in the world history. Learn more about how federal partners are continuing to closely monitor vaccine safety. A growing body of evidence has shown that these vaccines are safe and effective. COVID-19 vaccines were developed using scientific methods that have been around for decades. Before recommending COVID-19 vaccination, scientists conducted clinical trials. The FDA gave the Pfizer BioNTech COVID-19 vaccine emergency authorization to use in children ages 5 years through 15 years and full approval to use in people ages 16 years and older (Terefa, et al., 2021).

Some people have no side effects from COVID-19 vaccines while people have reported side effects that may affect their ability to do daily activities, but they could go away within a few days. Also, there is no evidence that COVID-19 vaccines cause fertility problems as the benefits of COVID-19 vaccination outweigh the known and potential risks. Reports of adverse events, like allergic reactions or myocarditis or pericarditis, are also rare. For the avoidance of doubt, everyone who receives a COVID-19 vaccine can participate in safety monitoring by enrolling themselves and their children ages 5 years and older in v-safe and completing health check-ins after COVID-19 vaccination (Mahmud, et al., 2021).

COVID -19-vaccines are effective and can reduce the risk of getting and spreading the virus that causes COVID-19 as they help children and adults from getting seriously ill even if they do get COVID-19. Though COVID-19 tends to be milder in children than adults, it can make children very

sick, require hospitalization, and some children have even died. Children with underlying medical conditions are more at risk for severe illness compared to children without underlying medical conditions. Getting children ages 5 years and older vaccinated can help protect them from serious short- and long-term complications, the same way everyone from age 5 years and older who get vaccinated receives protection for their families and communities, including friends and family who are not eligible for vaccination and people at increased risk for severe illness from COVID-19 (WHO, 2022).

In a related sense, after children and adults are fully vaccinated for COVID-19, they can resume many activities that they did before the pandemic. CDC recommends that fully vaccinated people wear a mask in public or indoor settings if they are in an area of substantial or high transmission. Fully vaccinated people might choose to mask regardless of the level of transmission, particularly if they or someone in their household is immune-compromised or at increased risk for severe disease, or if someone in their household is unvaccinated (Kalam, et al., 2021).

Additionally, children ages 5 years and older and adults who are eligible should get vaccinated regardless of whether they already had COVID-19. Evidence is emerging that people get better protection by being fully vaccinated compared with previously having a COVID-19 infection. One study showed that unvaccinated people who already had COVID-19 are more than two times more likely than fully vaccinated people to get COVID-19 again. This implies that immunity may only come after COVID-19 vaccination as none of the COVID-19 vaccines gives people COVID-19 because none of the COVID-19 vaccines contain the live virus that causes COVID-19, so COVID-19 vaccines cannot make anyone sick with COVID-19.

Finally, vaccines continue to reduce a person's risk of contracting the virus that causes COVID-19, including the different variants. Vaccines continue to be highly effective at preventing hospitalization and death, including against this variant. Fully vaccinated people with breakthrough infections from this variant only appear to be infectious but for a shorter period.

Acceptance Level of the Uptake of COVID-19 Vaccination

Hence, gaining an understanding of the resources that people trust the most to get information about COVID-19 vaccines is critical for the success of any future national vaccination campaign. In a further study, COVID-19 vaccine acceptance among college students in South Carolina was found to be affected by the information resources. Students largely trusted scientists (83), followed by healthcare providers (74), and then health agencies (70) (Qiao et al in Kalam, et al., 2021). In a study from France, vaccination practices and acceptance toward MMR and HBV vaccines were better when parents had reported getting the information from their healthcare providers compared with parents getting information from the internet or their relatives (Adedeji-Ademola, et al., 2020).

Recent research from China indicates that engaging in hand hygiene and other health protective behaviors was associated with reduced psychological impact of the COVID-19 outbreak, including lower stress and anxiety (El-Elimat., et al., 2021). These findings highlight the importance of encouraging the public to engage with such behaviors not only to reduce the risk of infection but also to reduce anxiety associated with COVID19. Over the past decade, it has comprehensively explored the landscape of vaccine confidence issues and experiences in managing confidence crises around the world (Fowlkes, et al., 2021). These studies have focused that a multiplicity of factors influencing vaccine decisions, key drivers of public confidence in vaccines were identified as trust in the importance, safety, and effectiveness of vaccines, along with compatibility of vaccination with religious beliefs (Alhassan, et al., 2021). These findings have resulted in the development of a Vaccine Confidence Index survey tool to measure individual perceptions on the safety, importance,

effectiveness, and religious compatibility of vaccines. The research questionnaire has the primary focus of measuring confidence across multiple countries while being minimal, thus allowing ready integration into existing global surveys.

The survey is one of a diverse set of metrics and indices used to measure confidence or hesitancy such as the Parent Attitudes About Childhood Vaccines Survey, which measures vaccine hesitancy among parents; the Vaccination Confidence Scale, which measures confidence in adolescent vaccination; the 5-C scale such as confidence, complacency, constraints, calculation, and collective responsibility, which identifies psychological barriers of vaccination behavior; and the SAGE Vaccine Hesitancy Scale, which has been deployed across multiple countries (Elkalmi, et al., 2021). In 2017, the vaccine manufacturer Sanofi announced that their newly introduced dengue vaccine Dengvaxia posed a risk to individuals who had not previously been exposed to the virus, prompting outrage and panic across the population where nearly 850 000 children had been given the new vaccine the previous year. As the research measured a baseline confidence value in 2015, that were able to measure the change in confidence following the vaccine scare and found a significant drop in confidence in vaccine importance, safety, effectiveness (Larson et al 2019).

The survey study tool has detected a rise in confidence across the country although confidence is not back to 2015 levels indicating a possible recovery and highlighting the value of the tool in assessing the effectiveness of national level policy. Japan ranked among the countries with the lowest vaccine confidence in the world: this might be linked to the human papillomavirus (HPV) vaccine safety scares that started in 2013, and following the decision by the Japanese Ministry of Health, Labor and Welfare in June, 2013, to suspend proactive recommendation of the HPV vaccine (Simms et al 2020).

As a result of this vaccine safety scare, HPV vaccination coverage decreased from 68.4–74.0 in the 1994–98 birth cohort to 0•6 in the 2000 birth cohort.36 The news of Japan suspending their proactive recommendation of the HPV vaccine has travelled globally through online media and social media networks, being applauded by ant vaccination groups but not by the global scientific community (Larson et al 2014). Moreover, Indonesia witnessed a large drop in confidence between 2015 and 2019, partly triggered by Muslim leaders questioning the safety of the measles, mumps, and rubella (MMR) vaccine, and ultimately issuing a religious ruling claiming that the vaccine was haram and contained ingredients derived from pigs and thus not acceptable for Muslims.

These relationships may be complicated for example, an individual highly compliant with social distancing measures may perceive their risk to be low but still want to obtain a vaccine. Lower vaccine acceptance among the retired population might be influenced by lower perceived risk. Although the elderly are more vulnerable to COVID-19, most of the retired population in Southeast Asian countries have low mobility and spend more time at home with less travel. These behaviors may lead them to having a lower perceived risk of being infected with SARS-CoV-2, and eventually may lead to lower acceptance of a vaccine. Moreover, their acceptance might also be influenced by knowledge about the disease. Much of the information about COVID-19 is spread through social media or online media, which is less frequently accessed by older adults. Therefore, older adults might have less exposure to information about COVID-19 that could contribute to framing their risk perception. In addition, less social media use might also be associated with less knowledge among the elderly and this could affect their perceived risk and vaccine acceptance (Terefa, et al., 2021).

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Barriers to Acceptance of the Vaccine

Apart from religious and cultural reasons or health conditions that justify not receiving the vaccine, the choice to refuse vaccination can be explained by a range of other factors. The following nine factors provide a good picture of the complexity of the situation (Terefa, et al., 2021, Mahmud, et al., 2021, Fowlkes, et al., 2021).

Misunderstanding and Lack of Information

A first barrier is lack of understanding about the vaccine or misunderstanding the necessity of vaccination. Faced with contradictory opinions and lack of information, some people are perplexed: Why should you get vaccinated if you can still catch the virus and transmit it? Why vaccinate young people if they are less vulnerable to the virus? Not finding satisfactory answers to these questions can paralyze someone's thought and reduce their willingness to take action.

Fear of Needles and Vaccines

Some people have a strong fear of needles or the pain related to vaccination. Although this fear may seem irrational to others, it is something the sufferer feels intensely, apprehension about needles or pain is sometimes so anxiety-producing that it can lead a person to avoid any situation that involves vaccination. Sometimes just seeing images of vaccination can provoke anxiety. In other cases, the fear is related to the possible side effects of the vaccine. Some people may not refuse to be vaccinated, but will wait until more people have been vaccinated so they can see if there are any long-term side effects (Terefa, et al., 202)).

Feelings of Helplessness

A further psychological barrier comes from the feelings of helplessness and discouragement in response to the possibility that the pandemic will continue, despite vaccination efforts, especially given the detection of new variants. The term "pandemic fatigue" reflects the weary and demotivated feeling that arises during a time of crisis when events appear to repeat themselves. Resignation and loss of hope can lead to reduced motivation, and unwillingness to follow recommendations, including vaccination.

Lackadaisical Attitude (Aware but Not Concerned)

Other people are aware of the impact of the pandemic, but do not feel personally concerned: "I'm healthy, so that protects me." These individuals often lack knowledge about the disease and vaccination, so they are not particularly concerned about the harmful effects of the virus on their health or the risks of transmission to others. It is worthy to note that these people are not actually opposed to the vaccine (Mahmud, et al., 2021).

Mistrust of Ingredients

Some people pay close attention to what goes into their bodies and may be concerned about the ingredients of the COVID-19 vaccine. They experience visceral discomfort at the idea of getting a vaccination, and may perceive the COVID-19 vaccine as an intrusion, contamination or aggression. Not knowing about the ingredients of the vaccine, they may be reluctant or even opposed to receiving it (Terefa, et al., 2021; Mayo Clinic, 2021).

Anxiety and Denial

Everyone reacts differently to anxiety-provoking situations. Some will jump into action and look for solutions; others will confide in loved ones or feel emotionally overwhelmed. Still others will go into denial. Denial is an automatic, unconscious reflex that works as a Band-Aid to control anxiety. In the pandemic context, this may be expressed as denial of the seriousness of the disease, denial of one's own vulnerability to contracting the virus, or even denial of the existence of the virus itself

(Olomofe, et al., 2021).

Sense of Rejection and Exclusion

As social beings, we are extremely sensitive to rejection. Rejection may be more common and painful for some than for others. These people feel more excluded from society and do not recognize themselves in the official discourse or the norms being proposed in response to the pandemic. When health measures are announced, these people may find them controlling. When one feels neither represented nor listened to by the authorities, or when one is parodied or criticized by other groups in society, the wounds of a past marked by rejection are reactivated and replayed. These people will also feel excluded and less likely to follow recommendations. They are also more likely to feel better understood by alternative and refractory voices that make them feel heard at last (Terefa, et al., 2021).

Dependency and Conflict Avoidance

Some people are more dependent on the opinions of those closest to them. The dynamics of the relationship are such that the person doubts themselves, relies on the other person to make day-to-day decisions for them and idealizes the other person or seeks to minimize conflicts with them. In these cases, the person's position and choice will be influenced by the fact that their peer does not consider vaccination to be important (Malik, et al., 2021).

Crisis of Confidence

The previously mentioned factors, such as mistrust of what goes into the body, denial and rejection, may crystallize into a greater distrust of government sources, health authorities and the pharmaceutical industry. This can also turn into crisis of confidence and distrust of public health recommendations. belief in conspiracy theories and the rejection of authority can shape one's thinking and identity. That in turn creates a danger of polarization (Terefa, et al., 2021).

Conclusion

The major barrier to COVID-19 vaccine acceptance among health worker is due to incognizant COVID-19 vaccine. Barriers to COVID-19 vaccine acceptance among health workers is due to reasons such as: it is unsafe, lack of trust in government and manufacturers of the vaccine, that the vaccine has not gone through enough clinical trials, it could be associated with side effects, and lastly because they wanted to see what would happen to those who received the vaccine.

Government should do more to encourage health workers and the general public on receiving the vaccine through the social media. Every health worker should get the COVID-19 Vaccine as the reasons for hesitancy are not strong enough when compared to the fatality recorded so far. Emphasis should be stressed on the short life- span of the side effects following the vaccine jabs. Significant number of persons who have been vaccinated are living healthy lives as can be testified around us today, which as negated one of the reasons for hesitance.

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Ageing Population: An Implication for Nurses

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Abstract:

Ageing is a universal phenomenon that is obvious as well as inevitable. It is a process that begins from conception and continues for as long as we live. The concept of ageing is multifaceted. Though old age is not a disease, it is the phase of retrograde biological process in growth and development which leads to decreased powers of survival and adjustment. In the care of the elderly, the severely impaired or dependent elderly will need range of professional care as well as with their families. Caring for the elderly by nurses is very challenging, time consuming and tasking. In the process of creating adequate services, home care and institutional service are complementary and multi directional and care of such patients need shared responsibility of both families and professional service provider. It is recommended that Nurses should advocate for the elderly since it is expected that social services would be overwhelmed by the growing ageing population.

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Introduction

Ageing is a universal phenomenon that is obvious as well as inevitable. According to UN projections, there will be 1.2 billion old people in the globe in 2025, with 71 percent of them anticipated to live in developing countries. The "Old" Old (those aged 80 and up) will grow twice as quickly as the 60-plus age group between 1950 and 2025. In these circumstances, we have two key challenges: providing older people with possibilities for independence, health, production, and protection while maintaining societal economic prosperity.

Concept of Ageing

Ageing is defined as changes that significantly decrease the probability of survival caused by processes within the individual that are universal, inevitable and irreversible. It is a multidimensional process of physical, psychological and social accumulation of change in a person over time (Abanyam, 2012). It is a process that begins from conception and continues for as long as we live. Individual age at different rates and their ageing experience is unique and there are generalizations which can be observed for each of the body systems (Boswell, 2012).

Ageing may be “universal” that is (age changes that all people share); “probabilistic ageing” (age changes that may happen to some but not all people as they grow older); “social/cultural ageing” (expectations of how people should act as they grow older); “biological ageing” (an organism’s physical state as it ages); “proximal ageing” (age-based effects that comes about because of factors in the recent past); “distal ageing” (age-based differences that can be traced back to a cause in early life (Ali, et al., 2018).

Old age is a significant stage in life and normally related to life expectancy of given area, hence the conditions and the needs of the elderly becomes imperative. Preparation for old age cannot be over emphasized. Ageing does not only refer to an individual’s chronological or physiological age, but also the attitudes, viewpoints and belief towards ageing. The way nations or individuals define who is considered an elderly has to do, or could be as a result of elements of social construction both at local and global level. The concept of who is an elderly comes as a result of interactions among individuals in the society. As far as assumptions and expectations on ageing is concerned, each culture holds its own perspectives or view-points on ageing, which in all, is part of socialization. Some define the elderly in measure of physical health while others define it in terms of chronological age.

According to the WHO, most developed countries have accepted the chronological age of 65 years and above as the definition of an elderly person, for this is the age within which an individual could start receiving pension benefits. At the moment, there is no United Nations numerical standard criterion to refer to an elderly population, though it has agreed on the 60 and above as cut off point in reference to older population (United Nations, 2017). Ageing can be categorized into three groups such as; “the young old” ages from (60- 74years); “the middle old” (75-84years) and “the older old (oldest)” (85years and above) (Cadmus, et al., 2017).

The concept of ageing is multifaceted. This is because its in-depth description or explanation covers diverse areas of human development. There are chronological, biological, psychological and social, functional dimensions of ageing (Luhmann & Hawkley, 2016). The chronological dimension describes the number of years that have slipped away since one’s birth while the biological explains the status of vital organs of the body as an individual advances in age. The psychological dimension focuses on individuals’ ability to adapt to environmental demands/challenges while social dimension sheds light on how an individual conforms to written and unwritten norms, roles expected of him/her by the society in which he/she operates. The functional dimension measures

how effective an individual is in physical and social environment when compared with other people within his/ her age bracket (Luhmann & Hawkley, 2016).

Ageing process is a biological reality which has its own dynamics largely beyond human control. It is subject to the constructions by which each society makes sense of old age. As observed so far, in the developed world, chronological age plays a paramount role. The age of 60 or 65 roughly equivalent to retirement ages in most developed countries is said to be the beginning of old age. In many parts of the developing world, chronological age has little or no importance in the meaning of old age. Socially constructed meanings of elderly are more significant such as the roles assigned to the elderly in some cases. The loss of the roles accompanying some physical declines is significant in defining old age in many developing countries. Thus, in contrast to the chronological milestones which mark life stages in the developed world, WHO (2019) however posited that old age in many developing countries is seen to begin at the point when active contributions to life is no longer possible.

The Ageing Population

The population of old people throughout the world is increasing at a very rapid rate (Population Reference Bureau, 2011). The most rapid increase is taking place in the developing world with Africa alone projected to have between 204 and 210 million old people by the year 2050. This unprecedented rise in the number old people presents fundamental socio-economic difficulties (Olaleye, 2011). Nigeria with a population of 140.8 million people (NPC 2006) is the most populated nation in Africa and the ninth in the world (UN, 2005). Life expectancy at birth stands at 57.6 years (NPC, 2008). The population growth rate (2000 – 2005) is 2.5% with 5.6% of the total population aged 60 and above. As the most populous country in Africa, Nigeria currently has the highest number of aged or elderly people in Africa Population Reference Bureau (PRB, 2011) with the largest population in Africa and the ninth in the world, it is estimated that by year 2025, the population of Nigeria aged 60 and above will constitute 6 percent of the entire population as projected by (UN population Division, 2005).

Old age is not a disease; it is the phase of retrograde biological process in growth and development which leads to decreased powers of survival and adjustment. The World Health Organization has always designated as "Elderly" people aged 65 years and above. In 1980, the United Nations defined 60 years as the age of transition of people (U.N, 2004). The elderly make up an increasing proportion of the population in developed world and this demographic transition also affects some developing countries. Generally the elderly are at increased risk of disease, disability, social and financial deprivation compared to the younger generation in the same population (National Council on Ageing and the elderly (NCAOP), 2005). An increase in the number of the elderly will lead to increased demands on health and support services including elderly care residential services and acute health service (Mccormacks, 2004).

Characteristics and Challenges of the Ageing Population

The elderly population is increasing in all countries of the world (World Population Ageing, 2013). This is due to several factors including decline in fertility, improvement in public health and increase in life expectancy. The decline in fertility is brought about by a more widespread acceptability of family planning, while increase in life expectancy is attributable to improved medical care brought about by technological advancement (Asiyanbola, 2005). As there are regional differences between developed and developing nations of the world, so there are differences among regions globally in the number of older persons (United Nations, 2002; Okumagba, 2011).

Okumagba (2011) observes that in developed regions of the world, about one-fifth of the population was aged 60 and above in the year 2000 and that it is expected that by 2050, their population would have reached one-third. However, in developing regions of the globe, 8 percent of their population is over 60 years of age and it is equally expected that by 2050, those within the age group will reach 20 percent of the population (United Nations, 2002). Comparatively, U.S Census Bureau (2009) projects that the number of people older than 65 will double to 14 percent from 7 percent of the world's population in the next 30 years, thus, rising to 1.4 billion by 2040 from about 506 million in 2008. This rapid rise in the elderly population according to the U.S Census Bureau (2009), is taking place in developing countries where increase in the number of people aged 65years and older is more than double the rate in developed nations. The U.S. Census Bureau (2009) observes that 313 million or 62 percent, of the world's elderly lived in developing countries, and their population is projected to rise to more than one billion, 76 percent of the world's 65-and-over population by 2040.

Nigeria which has a population of approximately 150 million (NPC, 2006) is ranked the most populated African nation and the ninth in the world (UN, 2004). Various published demographic projections showed that the proportion of elderly persons in Nigeria is on the increase. According to the 1991 Population Census, there were 4,598,114 persons aged 60 and above in Nigeria. This was about 5.2 percent of the total national population of 88,992,220. The number of the elderly is projected to have increased to around 5 million by the year 2000 (NPC, 1998). In the 2006 Population and Housing Census in Nigeria, 6,987,047 persons making up 4.9 percent of the population were aged 60 years and above. Even though there is a slight decrease in the percentage of the elderly population from the 1991 census, there is an observable increase in the absolute number of the elderly population. With regards to sex composition of the elderly national population, there were more males than females in all age groups 60+, only 44 percent were females.

The first sign of ageing begins with the skin which becomes drier, thinner and has elastic wrinkles, visible blood vessels and pocket of fat under the skin appear as irrefutable evidence of the passage of time (Levant et al, 2015). Merrill and Verbrugge (2011) also revealed that with time pockets of fat settle on various parts of the body most noticeable around the abdomen, but also on the upper arms, the buttocks, eyelids and double chin, bones become fragile and more easily broken and difficult to heal. The Muscles loose power and become atrophy while joints stiffen or wear out, circulation slows down, blood pressure rises and because the lungs hold less oxygen the elderly has less energy, reaction to stimuli is slower and there is less resistance to illness. There are difficulties to fall asleep and remaining asleep and vision, hearing and sense of smell became less acute (Levant, et al., 2015).

Disability significantly affects quality of life in old age though it is considered to be consequences of the normal ageing process; they are often caused by chronic diseases which the elderly are at risk (Szucs, 2001). There seems to be a problem with providing the appropriate care for these disabilities for this segment of the population yet the population is growing rapidly in both developed and developing countries (Vitalianie, et al., 2003).

The lack of health care for senior citizens is a crucial problem with the assumption that provision of healthcare services has always been adequate. This assumption is wrong as recent research has shown that Medical care is not easily accessible. This is because the geographical distance to get to these services makes it difficult, if not impossible for many the elderly to access, particularly in the rural areas (Nussbaum, 2003). Hence, their health needs still has to be met by visiting traditional

medical men and herbalists. At the family level care services provided do not adequately meet the needs of the old persons. Diminishing economic power has hindered the willing family members. However these changes demand that governments, the private sector, nongovernmental organizations and the civil society in general be prepared to deal with them, bearing in mind the special needs of the people.

Nevertheless, most elderly persons cannot afford quality medical care. A survey of more than 3,200 senior citizens found that many people would be prepared to pay for high quality elderly care, while wanting a safety net for those who cannot afford to pay (O' Neil, 2010). The care and support by the family and community that were taken for granted in the past have stopped, because of changes in the society associated with urbanization and development in general (Ting & Woo, 2009).

In some communities in Africa instead of relaxing and enjoying old age, the senior citizens are obliged, once again, to take up the responsibility of caring for children and young adults suffering from HIV/AIDs related problems or migrate. Apart from the children, old people are the social group most vulnerable to the numerous ills facing Africa, poverty, food insecurity, civil strife, armed conflict, violence and inadequate social welfare services.

National Council on Ageing (2020) suggest that sensory loss will make any elderly person to forget something that is immediate, but may sometimes remember things in the far past. Most elderly are afraid to being hospitalized, for they had already assumed hospital to be dying places (Lecovich, 2008). Humphries, et al (2008) also observed that living patterns are changing as urbanization has resulted in many elderly people living alone in rural areas. This occurs, when their children might have migrated to the urban centre, in search for greener pasture. Economic pressure and changing social values mean that many families are either unable or unwilling to care for the elderly. The contributions that elderly people make to the family are seldom acknowledged and programmes designed to support families fail to take into account the valuable role that old people do play (Cadmus, et al., 2017).

Common Diseases associated with the Ageing Population

As a person ages, the immune system weakens, organs begin to deteriorate and body becomes susceptible to variety of diseases. Some of the common diseases of ageing are

Arthritis: - This refers to a variety of inflammatory joint disorders including osteoarthritis, rheumatoid arthritis and gout. Symptoms are pain, swelling of the joint and difficulty in moving. Arthritics is the commonest problem ageing in humans (Iwasaki & Jones, 2008)

Alzheimer's Diseases: - This is the disorder of the brain, including the death of brain cells which affects brain functioning and cognitive ability. It prevents with minor memory loss and confusion and progresses to more severe cognitive and physical impairment. It is the major cause of frailty which leads to falls in aged persons

Cardiovascular Diseases (CVD): - refers to a variety of disorders, including pericarditis (inflammation of the pericardium), artherosclerosis (fatty deposit in the arteries) hypertension (High Blood Pressure) etc. Symptoms include chest pain, breathlessness, dizziness, palpitations, stroke, severe headache etc.

Parkinson 's Disease: - This is a disorder of the nervous system manifesting in tremors, slow movements, speech impairment, dementia and difficulty in walking.

Pneumonia: - An inflammation of the lungs caused by a bacterial, viral or fungal infection. Pneumonia present in cold symptoms, shivers, blood stained sputum, headache, cough, vomiting and chest pain.

Stroke: - This is a condition in which a blood vessel leading to the brain gets clogged or bursts, thus

denying part of the brain blood flow and oxygen and eventually killing the cells in that part of the brain. Stroke presents with numbness, weakness speech impairment, severe headache, dizziness and vision problems.

Caring for the Ageing Population

Caring for an elderly person does not come without challenges for those who give or practice it either by requiring their substances, presence, touch or attention to listen to the elderly (Faronbi, et al 2017). Some elderly persons are active right up until they succumb to natural causes of death, while some experience health problems for years. All elderly persons have a host of daily living issues to contend with. Finances, movement, house chores, etc are some of the "Activities of Daily Living" that become more difficult as one gets older.

The elderly consequently face a broad range of medical and physical needs that require assistance and supervision on a temporary or full-time basis, depending on their needs. Knowing their care needs will help health professionals to understand how to help them or find someone who can assist (Bass & Noelker, 2007). In other words, the social and medical programs and facilities intended for the care and maintenance of the aged or the elderly people is simply the meaning of the concept of 'Care' for the elderly as operationalized in this study.

In general terms, those who feel concerned to care for the elderly are potential Elderly Health professionals. It could be government, NGOs, Nurses in Adult Homes, individuals in the society who are not relations of the elderly, spouses of the elderly, adult children of the elderly (sons and daughters), daughters-in-law and grandchildren.

Traditionally, the care for the elderly in Nigeria has been within the extended family system (Faronbi, et al., 2017). They are cared for by their children, daughters-in-law and other extended family members like grandchildren. Researchers have found that within families there is a hierarchy of health professionals providing care to older persons (Horowitz, 2005). Their spouses are first expected to assume care-giving responsibilities if they do not have limitations of their own that might prevent them from providing the care, followed by an adult-daughter or daughter in-law (Merrill, 2003; Peters-Davis, et al., 2009; Stephens & Franks, 2009).

It is important for nurses to have adequate knowledge on the basic needs of the elderly than the rest of the population (Okoye & Asa, 2011). This is necessary because these needs must be met every day for the elderly to be able to live independently for as long as possible and nurses would be able to help the elderly meet these needs without compromising their health and safety. Nurses need to have adequate knowledge of taking care of the elderly.

According to Redmond, et al. (2008), ageism has been found to negatively affect the health care services that older persons receives, both implicitly through unfair resource allocation by stakeholders and explicitly by providing offensive and poor quality treatment. Maltreatment of the elderly has been identified in facilities for continuing care such as nursing home, residential care, hospitals and day care facilities. The spectrum of these within institution may be related to any of the following, the provision of care for example resistance to changes in geriatric medicine, erosion of individuality of care, inadequate nutrition and deficient nursing care problem with staffing, poor interaction/communication and poor environment, and organization policies – bureaucratic or unsympathetic attitudes toward residents (National Council on Ageing, 2020).

Esopenko and Levine (2015) stipulated that in the care of the elderly, the severely impaired and dependent elderly will need range of professional care as well as with their families so in the process of creating adequate services, home care and institutional service are complementary and multi directional and care of such patients need shared responsibility of both families and

professional service provider.

Problems Associated with Care of the Ageing Population

Nurses experience different health problems when taking care of the elderly. These problems results from the responsibilities and task involved in caring for the elderly. The daily tasks involved include bathing, dressing, feeding, lifting, turning him or her in bed, cooking, shopping, paying of bills, running errands, giving medicine, keeping him or her company, providing emotional support (Okoye & Asa, 2011). All these help can be time consuming and emotionally, physically and psychologically draining and may expose the health worker to stress, risk of diseases, neglect of one self, poor health and depression (Donatelle, 2011).

According to Donatelle (2011), some nurses get easily irritated when taking care of the elderly than when taking care of other age groups because of the daily task involved. The stress impact negatively on the health of the health workers or cause the health workers to be physically or verbally aggressive towards the care receiver. Studies have shown that one reason for elderly abuse and neglect is caregiver's stress (Lecovich, 2008). It is also very common for health workers to get angry, feel frustrated, guilt, isolated, unhappy in marriage, anxiety, depressed, diminished socially, loss of self-esteem from time to time and dissatisfaction with life.

According to Okoye and Asa (2011) feeling guilty about all the things that are not going on right is the cardinal feature of nurses' experience. Stress of caregivers has been shown to be influenced by many factors which include the attitude of the health professional or care giver (Okoye & Asa, 2011).

Okoye and Asa (2011) in a study of leisure and distress in care givers for elderly patients revealed that nurses taking care of the elderly are more likely to neglect their own needs because care of the elderly is time consuming and tasking. They may not recognize or may ignore the signs of illness, exhaustion or depression that they are experiencing. Frustration is also one of the feelings that may occur as a result of taking care of the elderly. This arises out of trying to change an uncontrollable condition in taking care of the elderly especially Alzheimer's disease or other kinds of dementia (Alzheimer's, Society, 2009).

Nurses taking care of the elderly are also at risk of contracting diseases because of the closeness and commitment needed in the care of the elderly (Lecovich, 2008). Accordingly, Merril and Verbrugge, (2011) common diseases that affect the elderly that can be transmitted to the caregivers are Tuberculosis, HIV/AIDS among others.

Conclusion

Ageing can result in a variety of health problems. With the elderly accounting for 12% of the world's population and expected to rise to almost 22% by 2050, It's critical to identify the obstacles that people experience as they age and to recognize that there are preventive actions you (or a loved one) can take to put yourself (or a loved one) on a path to healthy ageing. As a result, nurses have a responsibility to act independently of the environment in order to promote quality of life and active ageing.

As a result, organizations concerned, as well as society as a whole, should work to create an aged-friendly environment that can provide useful knowledge to the old. Nurses need to wake up to the impending issues of health care and fill in the gaps for our community's elderly.

Being aware of age-related psychological changes, such as reduced level of vision and hearing, slower processing and reaction time, will allow caregivers to properly manage health risks and make well informed decisions. Such enlightenment could help maintain the physical and mental health of the ageing population.

The aforementioned preventative levels of care can help with quality of care and active ageing. Primary prevention for the elderly assures not only the prevention of death but also the promotion of health in old age. Nurses should advocate for the elderly since it is expected that social services would be overwhelmed by the growing ageing population. Qualified personnel should be hired by health facilities to conduct evaluations on the projected new geriatric population. The care of the elderly is being harmed by a "nursing shortage," and nurses are "too busy" to assist elderly patients with basic care. This attitude must change.

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Test-Taking Strategies as Determinant of Students' Academic Performance in Mathematics Public Secondary Schools in Ekiti State

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Abstract:

The study examined test-taking strategies as determinant of students' academic performance in Mathematics public secondary schools in Ekiti State. The study specifically investigated the predictive strength of components of test-taking strategies such as using mnemonics, permutation, testwiseness and skimming test questions on academic performance of students in Mathematics. This research adopted a descriptive research of survey design. The population for this study consisted of all S.S.S 2 students in public secondary schools in Ekiti State. The sample for the study consisted of 177 S.S.S 2 students drawn from 6 public secondary schools in Ekiti State using multistage sampling procedure. Two instruments tagged Test-taking Strategies Questionnaire (TTSQ) and Performance Test in Mathematics (PTM) were used to collect data for the study. The instruments for the study were validated by experts in the area of Tests and Measurement. The reliability of the instruments was determined through the test re-test method. Co-efficient values of 0.71 and 0.79 were obtained for TTSQ and PTM respectively. The hypotheses were tested at 0.05 level of significance using inferential statistics of simple regression analysis. The study revealed that components of test-taking strategies such as mnemonics ($R^2 = 0.327$), permutation ($R^2 = 0.229$), testwiseness ($R^2 = 0.316$) and skimming test questions ($R^2 = 0.193$) significantly contributed to the academic performance of students in Mathematics. The study concluded that test-taking strategies have impact on students' academic performance in Mathematics. It was recommended among others that students should be given adequate orientation through workshops to update their knowledge in the use of test-taking strategies.

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Introduction

Tests are usually designed to assess students' knowledge in particular content or materials. When other factors affect students' performance, test scores are no longer valid measures of students' knowledge or ability levels. A test can be defined as an instrument of measurement relating to human behaviour. A test is a measurement device or technique used to qualify behavior or aid in the understanding and prediction of behaviour. Indeed, Kolawole and Oluwatayo (2001) identified some vital purposes of reliable and valid test items including certification after completing a prescribed course of study, for diagnosing learning difficulties for selection into higher educational programme (aptitude test) for providing feedback on teaching-learning process, for gauging effectiveness of teaching methodology, for providing a basis for self-evaluation.

As Kpolovie (2012) noted not until a test is able to reflect the true attribute, characteristics and abilities of a student, then such a test is invalid. Unfortunately, with all the benefit of testing by revealing students' capabilities many students have independently branded themselves as not science oriented and incapable of undertaking mathematical related courses. Some who offer mathematical related courses have failed out of school, some have dropped, some have change their school, some have constantly change their mathematics teachers, some have lost confidence in themselves of being capable of solving any mathematics problem.

Students' poor performance in Mathematics could be attributed to so many factors among which are teaching strategies, teachers' attitude, lack of instructional materials students laziness but little or no attention has been given to what is happening during the conduct of Mathematics tests (Olofin & Olojo, 2022). Observing students taking Mathematics tests shows that some of the students who have adequate knowledge or have prepared well, do not perform well in their Mathematics tests. Some students start preparation early, and study well for the Mathematics test but their performance does not commensurate with the preparation. This could be as a result of inappropriate use or lack of Tests-taking strategies.

According to Cohen and Upton (2007), test-taking strategies are those test-taking processes which the respondents have selected and which they are conscious of, at least to some degree. Cohen (2006) classifies test-taking strategies into three types of language learner strategies, test-management strategies, and test-wiseness strategies. In order to get better scores, learners should know test-taking strategies which they can apply in language tests.

Tests-taking strategies are cognitive abilities to deal with any testing situation in appropriate manner and to know what to do during tests. Examples of these strategies are managing time effectively, surveying all questions before responding, solving easy questions first, checking and reviewing answers, underlying key words or concepts in questions, eliminating wrong options, and others. These strategies help students perform well in tests. Furthermore, so many studies and researchers have identified various strategies and techniques such as Strategies used before the tests, and Strategies used during the tests, which could be used to improve students' academic performance in Mathematics. However it seems as if most Mathematics students are ignorant of the strategies and the ones that are aware are not making use of these strategies appropriately.

Testing strategies help students translate their knowledge from classroom learning (McLellan & Craig 2019). Students who have or acquire test-taking strategies or skills will positively affect their testing competence and, hence, their academic performance. This is particularly true for low-ability students who perform better than expected. In fact, some argue that test-taking strategies are just as important as having the basic knowledge and information to answer the test

questions (Langerquist 2012).

In explaining why females generally do better than males in mathematics classes but show poorer performance on tests, Kimball (2009) suggested that the difference in test-taking strategies (e.g. problem-solving Strategies) used by males and females could be the reason behind the difference in test performance. Gallagher (2012) studied sex differences in problem-solving strategies used by high-scoring examinees in the mathematical section of the Scholastic Aptitude Test (SAT). In one part of this study, Gallagher analyzed the relationship among students' performances in SATs, the types of strategies they used, their attitude toward mathematics and their test-taking strategies. A strong relationship was found between performance in mathematics and test-taking strategies.

Since test anxiety is a fairly common problem in college students, having test-taking strategies can be extremely useful in reducing this anxiety. Test-taking strategies used effectively help examinees cope with the problem of test anxiety. For example, Carraway (2017) investigated the effect of a test-taking strategies seminar on improving students' scores in tests and on reducing their level of anxiety related to tests. The results of this study indicated that students who participated in the seminar had lower test-anxiety levels and higher test scores than their matched peers who did not participate in the seminar.

Tests are usually designed to assess students' knowledge in particular content or materials. When other factors affect students' performance, test scores are no longer valid measures of students' knowledge or ability levels. Test-taking strategies can improve the overall validity of the test scores so that they accurately reflect what students really know. This could be done by ensuring that students lose points only because they do not know the information and not for unrelated reasons.

Research has proven that students who are taught test-taking strategies generally do better on high stakes testing and have a better attitude about taking test (Scruggs & Mastropieri, 2021). Students, who are test-wise, approach test-taking in a positive way and have less test anxiety. It is a known fact that test anxiety can be a factor that affects the student's attitude toward the test. Students who are test wise and knowledgeable about test strategies score higher because they have the needed skills to help them handle difficult problems.

Students are taking more and more standardized tests than ever before and the stakes keep getting higher. Test-taking strategies are important to familiarize the students with methods to use when answering questions. By teaching students about test-taking strategies, they develop confidence and are familiar with test formats. This might not be true for all students; especially those who have taken the graduation test several times and failed, but the perception that all students hate standardized test is not true.

Research states that the teacher's attitude toward standardized testing has a direct relationship on student achievement (Green, 2012). If teachers become more knowledgeable about standardized testing they can use the results to enhance their teaching and their attitudes. Gulek (2003) believes that teachers should look at test preparation from an "instructional preparation practice standpoint; which will make teaching test-taking strategies effortless." These high-stakes test can keep students from graduating or passing to the next grade level. The pressure for teachers to prepare their students to meet the demands of standardized tests can create a very negative atmosphere.

Iza and Gil (2015) describes mnemonic as memory-enhancing pedagogical methods aimed at improving learning and information recall through the use of imagery**.** A common criticism of

mnemonics is that they only encourage rote memorization and do not help with higher order skills, such as comprehension or the transfer of knowledge. This criticism can be addressed with two responses.

Iza and Gil (2015) argued that although many teachers aspire for their students to be critical, insightful, curious, and deeply appreciative of the subject matter, education still requires a great deal of fact learning, which mnemonics can help with. Learning basic facts with mnemonics leaves more time for higher order learning. Permutation involves predicting questions for the next test. Some students write questions (different types) on each chapter/unit during private studying and likewise provide solution for such questions. Some students do poorly in test because of lack of ability to predict test questions.

Skimming is a technique that enables the reader to cover a vast amount of material very rapidly. Skimming is used to quickly identify the main ideas of a text. People often skim when they have lots of material to read in a limited amount of time. According to Sutz and Weverka (2015), when the readers skim a page, they take the main ideas from the reading material without reading all the words. The readers look for and seize upon words that appear to give the main meaning. Readers skim when time is short or when they need to understand the general ideas but not the particulars of an article or book. It takes three or four times faster than normal reading. According to Sutarsyah (2010), some of the words are not so important to understand that the readers may neglect them since they sometimes do not really connect to the idea being searched. The readers do not need to observe every single words in the text. Skimming takes place while reading and allows the readers to look for details in addition to the main ideas.

Testwiseness has been defined as the ability to respond advantageously to items containing extraneous clues and, therefore, to obtain credit without knowledge of the subject matter being tested. Similarly, Bachman (2010) defines testwiseness as a set of individual characteristics related to the amount and type of preparation or prior experience with a given test. They include the conscious pacing of one's time, reading questions before the passage upon which they are based and ruling out as many alternatives as possible in multiple choice items and then guessing among the ones remaining. Testwiseness is an individual's ability to improve his or her test score by recognizing and utilizing cues in the test multiple choice items, format or testing situation (Houston, 2015).

It is therefore necessary to examine test-taking strategies as determinant of students' academic performance in Mathematics public secondary schools in Ekiti State. The researcher was of the opinion that if the method of teaching is improved but poor test-taking strategies by students, it could affect students' performance in Mathematics. It is without doubt that some students prepare for Mathematics tests, but the problem is when do students start preparation and how do they prepare for Mathematics tests. It appears that some of the students do not start preparation until few weeks to the Mathematics tests. Some students of course attend Mathematics classes, partake in all Mathematics class activities and do the assignments given to them but they appear not to study intensively until few days to their Mathematics tests which may in turn affect their performance in the Mathematics tests. The study specifically investigated the predictive strength of components of test-taking strategies such as using mnemonics, permutation, testwiseness and skimming test questions on academic performance of students in Mathematics.

Research Hypotheses

The following hypotheses were formulated for this research:

1. Using mnemonics do not significantly predict the academic performance of students in Mathematics.
2. Permutation do not significantly predict the academic performance of students in Mathematics.
3. Testwiseness do not significantly predict the academic performance of students in Mathematics.
4. Skimming test questions do not significantly predict the academic performance of students in Mathematics.

Methodology

This research adopted a descriptive research of survey design. The population for this study consisted of all S.S.S 2 students in public Secondary Schools in Ekiti South Senatorial district of Ekiti State. The sample for the study consisted of 177 S.S.S 2 students drawn from 6 public secondary schools in Ekiti State. The sample was selected using multistage sampling procedure.

In stage one, two Local Governments were randomly selected through balloting method from the senatorial district in Ekiti State. In stage two, three public secondary schools were selected through stratified random sampling technique from each of the two local governments chosen for the study. In stage three, 177 S.S.S. 2 students were selected from the 6 public secondary schools using proportionate stratified random sampling technique.

Two instruments tagged Test-taking Strategies Questionnaire (TTSQ) and Performance Test in Mathematics (PTM) were used to collect relevant data for the study. Both instruments consisted of two sections namely Section A and B. *Section A* of the TTSQ sought for demographic information about the respondents while Section B consisted of 16 items to elicit information on components of test taking strategies. The continuum was using the 5 point Likert type - Very Much Like (VM); Much Like (ML); Unlike (UL); Very Much Unlike (VMU); and Not Sure (NS) which were scored 5, 4, 3, 2, and 1 respectively. The Performance Test in Mathematics (PTM) consisted of 30 objective test items in Mathematics

The instruments for the study were validated by experts in the area of Tests and Measurement. The experts determined its face and content to ensure the appropriateness of the instruments in measuring what they are supposed to measure.

The reliability of the instruments was determined through the test re-test method in two secondary schools outside the sampled area. The schools shared similar characteristics with the sample schools. The instruments were administered twice on 20 respondents in two schools within interval of two weeks. The data collected on the two administrations were collated and analyzed using the Pearson's Product Moment Correlation analysis. Co-efficient values of 0.71 and 0.79 were obtained for TTSQ and PTM respectively.

The researcher visited the sampled schools in each of the selected local government areas to administer the research instruments. The researcher personally visited each of the school sampled to administer the instruments with the help of two trained research assistants. The instruments were administered on Mathematics students and retrieved immediately after the respondents have responded to the instruments. The researcher's personal contact and visit to the respondents helped in ensuring better understanding of the instruments and also ease retrieval of the instruments.

The data collected through the instruments were analyzed using descriptive and inferential statistics. The hypotheses were tested at 0.05 level of significance using inferential statistics of simple regression analysis.

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Results

Hypothesis 1: Using mnemonics do not significantly predict the academic performance of students in Mathematics.

In testing this hypothesis, data on mnemonics sub-variable of test-taking strategies were collected from the responses of the respondents to items under Section B of TTSQ (item 1 – 4) in the questionnaire. Data on students' academic performance were collected from the Performance Test in Mathematics (PTM). Both were compared for statistical significance using Simple Regression Analysis at 0.05 level of significance. The result is presented in table 1.

Table 1: Simple regression analysis between mnemonics and academic performance of students in Mathematics

	Unstandardized Coefficients		**Stand. Coefficients**				
Variables	**(B)**	**Std Error**	**(Beta)**	**t- Stat.**	**R**	**R^2**	**F**
Constant	0.221	0.764	-	0.290	0.572	0.327	110.145
Mnemonics	0.674	0.057	0.572	11.796			

In table 1, the calculated F-value of 110.145 is significant at P<0.05, therefore the null hypothesis is rejected. It implies that using mnemonics significantly predicted the academic performance of students in Mathematics. The result of the analysis shown in Table 1 indicated the predictors accounted for 32.7 percent of the students' performance in Mathematics (R^2 = 0.327). It contributed 57.2% to the criterion variable in predicting students' academic performance in Mathematics.

The regression equation derivable from table 1 is Y= 0.221 + 0.674X

where:

Y = Students' academic performance in Mathematics

X = Mnemonics

Hypothesis 2: Permutation do not significantly predict the academic performance of students in Mathematics.

In testing this hypothesis, data on permutation sub-variable of test-taking strategies were collected from the responses of the respondents to items under Section B of TTSQ (item 5 – 8) in the questionnaire. Data on students' academic performance were collected from the Performance Test in Mathematics (PTM). Both were compared for statistical significance using Simple Regression Analysis at 0.05 level of significance. The result is presented in table 2.

Table 2: Simple regression analysis between permutation and academic performance of students in Mathematics

	Unstandardized Coefficients		**Stand. Coefficients**				
Variables	**(B)**	**Std Error**	**(Beta)**	**t- Stat.**	**R**	**R^2**	**F**
Constant	-0.885	1.093	-	-0.810	0.479	0.229	82.114
Permutation	0.898	0.097	0.479	9.225			

In table 2, the calculated F-value of 82.114 is significant at P<0.05, therefore the null hypothesis is rejected. It implies that permutation significantly predicted the academic

performance of students in Mathematics. The result of the analysis shown in Table 2 indicated the predictors accounted for 22.9 percent of the students' performance in Mathematics (R^2 = 0.229). It contributed 47.9% to the criterion variable in predicting students' academic performance in Mathematics.

The regression equation derivable from table 2 is Y= -0.885 + 0.898X

where:

Y = Students' academic performance in Mathematics

X = Permutation

Hypothesis 3: Testwiseness do not significantly predict the academic performance of students in Mathematics.

In testing this hypothesis, data on testwiseness sub-variable of test-taking strategies were collected from the responses of the respondents to items under Section B of TTSQ (item 9 – 12) in the questionnaire. Data on students' academic performance were collected from the Performance Test in Mathematics (PTM). Both were compared for statistical significance using Simple Regression Analysis at 0.05 level of significance. The result is presented in table 3.

Table 3: Simple regression analysis between testwiseness and academic performance of students in Mathematics

	Unstandardized Coefficients		**Stand. Coefficients**				
Variables	**(B)**	**Std Error**	**(Beta)**	**t- Stat.**	**R**	**R^2**	**F**
Constant	0.368	0.772	-	0.477	0.562	0.316	108.319
Testwiseness	0.664	0.058	0.562	11.486			

In table 3, the calculated F-value of 108.319 is significant at P<0.05, therefore the null hypothesis is rejected. It implies that testwiseness significantly predicted the academic performance of students in Mathematics. The result of the analysis indicated the predictors accounted for 31.6 percent of the students' performance in Mathematics (R^2 = 0.316). It contributed 56.2% to the criterion variable in predicting students' academic performance in Mathematics.

The regression equation derivable from table 3 is Y= 0.368 + 0.664X

where:

Y = Students' academic performance in Mathematics

X = Peer Tutoring

Hypothesis 4: Skimming test questions do not significantly predict the academic performance of students in Mathematics.

In testing this hypothesis, data on skimming test questions sub-variable of test-taking strategies were collected from the responses of the respondents to items under Section B of TTSQ (item 13 – 16) in the questionnaire. Data on students' academic performance were collected from the Performance Test in Mathematics (PTM). Both were compared for statistical significance using Simple Regression Analysis at 0.05 level of significance. The result is presented in table 4.

Table 4: Simple regression analysis between skimming test questions and academic performance of students in Mathematics

	Unstandardized Coefficients	**Stand. Coefficients**				

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Variables	**(B)**	**Std Error**	**(Beta)**	**t- Stat.**	**R**	**R^2**	**F**
Constant	2.253	0.841	-	2.679			
Skimming Test Questions	0.560	0.068	0.439	8.274	0.439	0.193	61.801

In table 4, the calculated F-value of 61.801 is significant at P<0.05, therefore the null hypothesis is rejected. It implies that skimming test questions significantly predicted the academic performance of students in Mathematics. The result of the analysis indicated the predictors accounted for 19.3 percent of the students' performance in Mathematics (R^2 = 0.193). It contributed 43.9% to the criterion variable in predicting students' academic performance in Mathematics.

The regression equation derivable from table 4 is Y= 2.253 + 0.560X

where:

Y = Students' academic performance in Mathematics

X = Skimming Test Questions

Discussion

The study revealed that components of test-taking strategies such as mnemonics, permutation, testwiseness and skimming test questions significantly contributed to the academic performance of students in Mathematics with mnemonics as the highest contributor to students' academic performance in Mathematics followed by testwiseness while skimming test questions was the least contributor to students' academic performance in Mathematics. The reason for this finding might be because of the submission of Iza and Gil (2015) who described mnemonic as memory-enhancing pedagogical methods aimed at improving learning and information recall through the use of imagery. Each mnemonic is designed to help remember a specific kind of information and it also aids retention. This finding is in consonance with the findings of Hammad (2010) and Iza and Gil (2015) who concluded that components of test-taking strategies used before test significantly contributed to the academic performance of students.

Students who are test wise can outperform students of equal ability who lack test-wiseness. This finding is in agreement with the findings of Abu Hashim (2012), Hamadneh (2016), Al-Mutlaq (2015) and Hammad (2010) who concluded that components of test-taking strategies such as testwiseness and skimming test questions used during test significantly contributed to students' academic performance.

Conclusion

It can be concluded that test-taking strategies have impact on students' academic performance in Mathematics. It is concluded that mnemonics, permutation, testwiseness and skimming test questions contribute to students' academic performance in Mathematics.

Recommendations

Based on the findings of this study, the following recommendations were made.

1. The use of test-taking strategies should be incorporated into Mathematics class in secondary schools because it improves students' academic performance and boost students' confidence in writing tests and examinations in Mathematics.
2. Students should be given adequate orientation through workshops to update their knowledge in the use of test-taking strategies.

3. Students should adopt a positive attitude to test-taking strategies in Mathematics as this will go a long way to reduce their test anxiety and improve their confidence in answering test questions in Mathematics.

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Effect of Concept Mapping Strategy On Senior Secondary School Students' Performance in Mathematics in Ekiti State, Nigeria

Author(s), Prof. Popoola Abiodun A., Mr. O. A. OJO

Abstract:

The study examined the effect of concept mapping strategy on senior secondary school students' performance in Mathematics in Ekiti State. The study adopted the quasi-experimental of pre-test, post-test design. The population for the study consisted of all the Senior Secondary School two (S.S.S.II) students in all public Secondary Schools in Ekiti State, Nigeria. The sample consisted of 151 S.S.S. II found in intact classes of the six schools that were selected for the study. The sample was selected using multistage sampling procedure. Mathematical Performance Test (MPT) was used to collect the needed data for this study. The instrument consisted of 25 items to examine the performance of students in Mathematics. The reliability of the instrument was established through a field testing which involved 30 senior secondary school students who were not part of the study. The internal consistency of the instrument was then ascertained using Cronbach Alpha which yielded a reliability coefficient of 0.805. The experimental procedure for the study was in three stages: the pre-treatment, the treatment and the post-treatment stage. The data collected were analysed using descriptive and inferential statistics. All hypotheses were tested at 0.05 level of significance. It was revealed that concept mapping strategy was more effective and reliable than the conventional method. Students performed better when exposed to concept mapping strategy than exposing them to conventional method in Mathematics. It was recommended among others that concept mapping strategy should be adopted as a means of instruction during Mathematics class. This will enable students to critically think and also allow students pay attention during Mathematics instruction.

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Introduction

Globally, mathematics is regarded as one of the most important subjects in the school curriculum worldwide. It is seen as a subject that has direct correlation with other subjects, particularly science and technology (Federal Republic of Nigeria, 2013; Popoola & Olofin, 2020). Mathematics remains one of the most difficult subjects in schools as perceived by students. There is general impression that Mathematics is difficult by its very nature and because of this impression, majority of students have phobia for it (Ampadu, 2012; Ojimba, 2012; Saad, et al., 2014). For students to participate fully in the society, they must learn Mathematics with understanding, connect mathematical idea and reason mathematically (Hollebrands, et al., 2010).

A lack of sufficient mathematical skill and understanding affects the ability to think critically in life and also to make proper career decisions. Thus, mathematics plays a very vital role in the modernisation of this civilisation. Mathematics is everywhere and it influence the everyday lives of people. A good score in mathematics is also a prerequisite for most courses in science-learning colleges and universities. Mathematics lays the foundation of scientific technical knowledge for industrial and technological advancement (Popoola, 2014). Despite the importance of Mathematics, many students are still not getting their feet in the subject. West African Examination Council (WAEC) recorded the average performance of candidates in Mathematics from 2016 – 2020 where an average of 51% of the candidates who sat for the examination failed Mathematics.

The performance of students in Mathematics could be attributed to certain factors which include mastery of the subject matter by the teacher, instructional (both human and material) resources, teaching strategy among others. The researcher observed that most common method used by Mathematics teachers in secondary schools is the conventional method which may not have meaningful impact on the performance of students in the subject like Mathematics. The researcher considers it necessary to explore the efficacies of concept mapping strategy on students' performance of Mathematics.

Concept mapping process externalizes the concepts in the student's existing knowledge structure; it is possible to identify misconceptions, incongruities and weaknesses in that existing knowledge structure. Therefore, this study uses concept mapping strategy with a view to finding how it can enhance students' academic performance in and attitude towards Mathematics. It is a meta-learning technique for assisting learners to organize information about concepts in a meaningful manner in order to facilitate meaningful learning.

Concept mapping is a structured process focused on a topic or construct of interest involving input from one or more participants that produces an interpretable pictorial view of their ideas and concepts and how these are interrelated (Yusuf, 2009). In concept maps, ideas are arranged hierarchically with the super ordinate concepts at the top of the map, and subordinate at the bottom which are less inclusive than higher ones. Rao (2015) stated that concept mapping strategy is hinged on the fact that concepts do not exist in isolation, but rather are inter-related with others to make meaning. The organization of new concepts, information or learning tasks in a manner that show how these concepts are interrelated may help the learner to make mental connections between these ideas.

Concept maps are considered to be potentially powerful problem-solving tools (Jonassen 2014). From this aspect, concept maps become a valuable tool for the development of problem solving abilities. Problem solving is a complex activity which involves a variety of components that include concepts, rules and principles. However, it also involves structural knowledge and metacognition skills (Jonassen 2014). Mapping provides opportunity for convergent thinking and Concept

mapping enhances meaningful understanding of scientific concepts.

Akinjiola (2010) also conducted a study on effect of concept mapping instructional strategy on junior secondary school students' performance in ratio and proportion in mathematics. The result showed that there was a significant difference in the mean score of male and female student when taught ratio and proportion using concept- mapping instructional strategy in favour of female. Githae, et al. (2015) suggest that a learner can use concept mapping to extract relationships between key concepts because knowledge is broken down into simple and more easily understandable parts.

Udeani and Okafor (2012) carried out a research on the effect of concept mapping instructional strategy on the Biology achievement of senior secondary school learners. A 30 –item multiple pre-test and post-test were used to collect the data and a t-test was used to test the hypotheses. Analysis of the post-test scores indicated that the group taught by the concept mapping instructional strategy performed significantly ($p < 0.05$) better than their expository group counterparts.

In view of the above, the study examined the effect of concept mapping strategy on senior secondary school students' performance in Mathematics in Ekiti State. The study specifically:

1. examined the performance of students in Mathematics before and after treatment; and
2. examined the difference in the pre-test and post-test mean scores of students exposed to concept mapping strategy and conventional method;

Research Question

This research question was raised for the study:

1. What is the performance difference of students in Mathematics of students exposed to concept mapping strategy and conventional method before and after treatment?

Research Hypotheses

The following null-hypotheses were formulated to guide the study:

1. There is no significant difference in the pre-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method.
2. There is no significant difference in the post-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method.
3. There is no significant difference in the pre-test and post-test mean scores of students exposed to concept mapping strategy and conventional method.

Methodology

The study adopted the quasi-experimental of pre-test, post-test design. The population for the study consisted of all the Senior Secondary School two (S.S.S. II) students in all public Secondary Schools in Ekiti State, Nigeria. The sample consisted of 151 S.S.S. II found in intact classes of the six schools that were selected for the study. The sample was selected using multistage sampling procedure.

Mathematical Performance Test (MPT) was used to collect the needed data for this study. The instrument consisted of 25 items to examine the performance of students in Mathematics. The reliability of the instrument was established through a field testing which involved 30 senior secondary school students who were not part of the study. The internal consistency of the instrument was then ascertained using Cronbach Alpha. This yielded a reliability coefficient of 0.805, which was considered high enough and reliable for the research.

The experimental procedure for the study was in three stages: the pre-treatment stage (one week), the treatment stage (five weeks) and the post-treatment stage (one week). Seven weeks were used altogether for the whole exercise. The data collected were analysed using descriptive and

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inferential statistics. The research questions raised were answered using descriptive statistics involving frequency counts, mean, standard deviation and percentages while the hypotheses postulated were tested using inferential statistics involving t-test and Univariate Analysis of Variance (two-way). Decisions were taken at 0.05 level of significance.

Results

Research Question 1: What is the performance difference of students in Mathematics of students exposed to concept mapping strategy and conventional method before and after treatment?

In answering the question, mean scores of students in Mathematics before and after being exposed to treatments were computed and compared. The result is presented in Table 1.

Table 1: Mean and standard deviation of pre-test and post-test scores of students exposed to concept mapping strategy and conventional method

Strategies	Test	N	Mean	S.D	Mean Diff.
Concept Mapping	Pre Test	74	47.31	9.78	**31.75**
	Post Test		79.06	7.09	
Conventional	Pre Test	77	46.94	10.19	**9.22**
	Post Test		56.16	9.81	
Total		**151**			

Table 1 revealed the performance of students in Mathematics before and after treatment. The performance of students exposed to concept mapping between pre-test and post-test scores is 31.75 while control group is 9.22. The graphical representation below further shows the more effective strategy in the teaching of Mathematics.

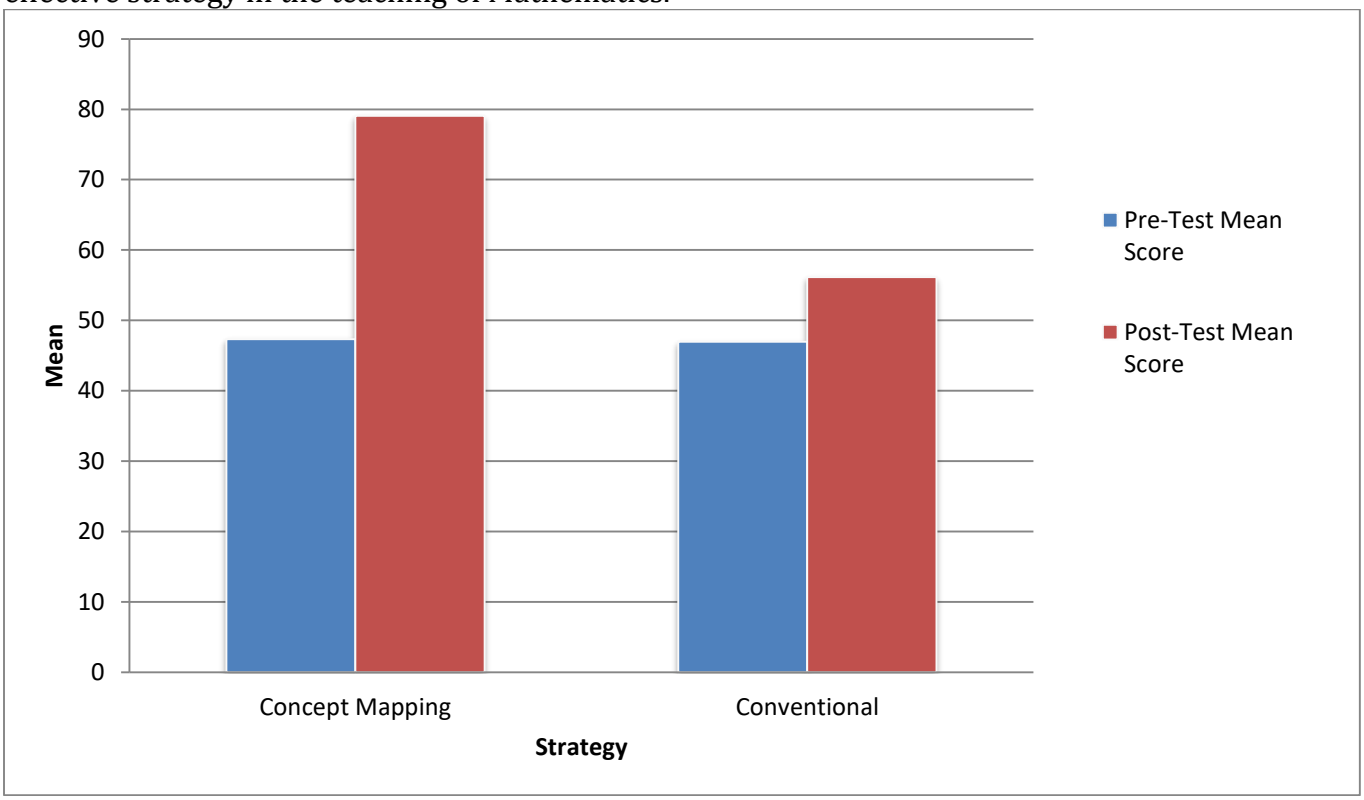

Figure i: Bar chart showing pre-test and post-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method

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Test of Hypotheses

H_o1: There is no significant difference in the pre-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method.

In order to test the hypothesis, performance of students before treatment were collected from Mathematical Performance Test (MPT). T-test was used to compute difference in performance before treatment. The result is presented in Table 2.

Table 2: t-test Analysis for difference in the pre-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method

Variations	N	Mean	SD	Df	t_{cal}	P
Concept Mapping	74	47.31	9.78	149	0.228	0.814
Conventional	77	46.94	10.19			

P>0.05

Table 2 shows that the t-cal value of 0.2284 was not significant because the P value of 0.814 was greater than 0.05 significant point. This implies that null hypothesis is not rejected. Therefore, there is no significant difference in the pre-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method. The implication of this finding is that the students exposed to concept mapping strategy and conventional method were homogeneous at the commencement of the study.

H_o2: There is no significant difference in the post-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method.

In order to test the hypothesis, performance of students after treatment were collected from Mathematical Performance Test (MPT). T-test was used to compute difference in performance before treatment. The result is presented in Table 3.

Table 3: t-test Analysis for difference in the post-test mean scores of students exposed to concept mapping strategy and conventional method

Variations	N	Mean	SD	df	t_{cal}	P
Concept Mapping	74	79.06	7.09	149	16.488*	0.000
Conventional Method	77	56.16	9.81			

*P<0.05

Table 3 shows that the t-cal value of 16.488 was significant because the P value of 0.000 was less than 0.05 significant point. This implies that null hypothesis is rejected. Therefore, there is significant difference in the post-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method.

H_o3: There is no significant difference in the pre-test and post-test mean scores of students exposed to concept mapping strategy and conventional method.

In order to test the hypothesis, performance of students before and after treatment were collected from Mathematical Performance Test (MPT). Analysis of Covariance was used to compute difference in performance before and after treatment in the groups. The result is presented in Table 4.

Table 4: Analysis of Covariance for difference in the pre-test and post-test mean scores of students in Mathematics in the groups

Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	3093.603	2	1546.802	226.704	.000
Intercept	921.929	1	921.929	135.121	.000

Pre-Test	9.511	1	9.511	1.394	.548
Groups	1101.271	1	1101.271	161.406*	.000
Error	1009.823	148	6.823		
Total	265130.718	151			
Corrected Total	5340.924	150			

a. R Squared = .807 (Adjusted R Squared = .800)

The result presented in table 4 shows that there is a significant difference in the pre-test and post-test mean scores of students exposed to concept mapping strategy and conventional method as F_{cal} = 161.406, P= 0.000<0.05. This result led to the rejection of the null hypothesis. By implication, there is significant difference in the pre-test and post-test mean scores of students exposed to concept mapping strategy and conventional method. In order to find out the more probable effective strategy, Multiple Classification Analysis (MCA) was carried out. The result is shown in Table 5.

Table 5: Multiple Classification Analysis (MCA) of students' performance in Mathematics by treatment

Grand Mean = 67.38

Variable + Category	N	Unadjusted Dev'n	Eta^2	Adjusted for Independent + Covariate	Beta
Concept Mapping	74	11.68	.79	11.62	.51
Conventional	77	-11.22		-11.35	
Multiple R					.898
Multiple R^2					.807

The result in Table 5 shows the Multiple Classification Analysis (MCA) of students' performance in Mathematics by treatment. It reveals that, with a grand mean of 67.38, students exposed to concept mapping had higher adjusted mean score of 79.06(67.38+11.68) than their counterparts exposed to conventional method 56.16(67.38+ (-11.22)). This implies that students exposed to concept mapping strategy performed better than students exposed to the conventional method. The treatment explained about 79% (Eta^2 = 0.79) of the observed variance in students' performance in Mathematics. The two treatment strategies accounted for 80.7% (R^2 = 0.807) contribution to academic performance of the students in Mathematics.

Discussion

The findings of the study descriptively revealed that the performance of students exposed to concept mapping between pre-test and post-test scores is 31.75 while control group is 9.22. The findings of the study revealed that there was no significant difference in the pre-test mean scores of students in Mathematics exposed to concept mapping strategy and conventional method. This finding established the homogeneity of the two groups involved in the study prior to the experiment. In other words, it could be said that the knowledge baseline for the two groups involved in the study are equal. Consequently, any significant difference recorded afterwards would not be ascribed to chance, but to the specific treatment applied.

It was however revealed that there was significant difference in the post-test mean scores of students exposed to concept mapping strategy and conventional method. Students exposed to

concept mapping performed better than students exposed to the conventional method. This finding is in consonance with the findings of Akinjiola (2010), Akeju, et al. (2011), Udeani and Okafor (2012), Carroll (2012) and Githae, et al. (2015) and as they concluded that concept mapping instructional strategy significantly impact students' performance in Mathematics and science related subjects.

Conclusion

Considering the findings of this study, it was concluded that, concept mapping strategy was more effective and reliable than the conventional method. Students performed better when exposed to concept mapping strategy than exposing them to conventional method in Mathematics.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Concept mapping strategy should be adopted as a means of instruction during Mathematics class. This will enable students to critically think and also allow students pay attention during Mathematics instruction.
2. The State Ministry of Education should expose Mathematics teachers to appropriate in-service training on the use of concept mapping strategy as this will enhance teachers' professional competencies in their jobs.

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Assessing the Assessment Literacy of Mathematics Teachers in Southwest, Nigeria

Author(s), Prof. OLUWATAYO, J. A. (Ph.D) , AYOOLA, O.O. (Ph.D)

Abstract:

The study investigated the assessment literacy of mathematics teachers in Southwest, Nigeria. The purpose of the study was to determine the level of assessment literacy of mathematics teachers in secondary schools. The study also investigated the exposure of mathematics teachers to assessment training. The descriptive research design of the survey type was adopted. The sample for the study consisted of 700 mathematics teachers selected through the multistage sampling technique from selected secondary schools in Southwest, Nigeria. Two research questions were raised and two hypotheses were generated for the study. Data collected were analyzed using descriptive and inferential statistics. The result from the teachers' responses showed that the level of assessment literacy of mathematics teachers was low despite their exposure to assessment training. However, gender and years of teaching experience does not influence the assessment literacy of mathematics teachers in secondary schools.

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Introduction

In secondary schools, students and teachers encounter classroom and non-classroom interactions. Such interactions usually define the school curriculum. In the course of these interactions, teachers endeavour to determine what students have learnt and are capable of learning. This is otherwise known as assessment. Assessment can be described as a systematic process of gathering information about what a student knows, does or learns. The term, assessment, is used to describe some of the ways by which teachers determine the learning experiences or outcomes of students. Assessment enables teachers to find out what students know and are capable of doing at a particular time. In other words, assessment helps teachers to identify or diagnose students' learning needs, design and implement instructional strategies (Frey, 2014).

Assessment is a tool in education that is of great benefit to both students and teachers. As noted by Soto and DeManilla (2015), the information gathered during assessment can be used by teachers to improve instruction or to summarize students' achievement and monitor their learning. This implies that assessment have some crucial roles to play when it comes to the process of instruction delivery. These roles could be in terms of development or accountability. Assessment has a developmental function when the results are used to inform instruction. It has an accountability function when it summarizes what students have learnt overtime. Thus, there is a short-term and long-term forms of assessment. Summarily, assessment of students in the classroom could be categorized into two major forms: formative assessment and summative assessment. Formative assessment determines learning progression and also corrects learning errors while summative assessment is designed to provide information on the performance of students at the end of the term/session.

Assessment in the classroom should be made comprehensive enough for decision making. In view of this, mathematics teachers need to be vast in the various assessment techniques that can be used to obtain information from the students. This was emphasized by Ayoola (2019). Witte (2010) also pointed out that classroom assessment should be an official tool every teacher needs to be armed with as expected in their professional practice. Classroom assessment matters a lot when it comes to students' achievement, most especially in Mathematics. Students' achievement (particularly those that are below average) tend to improve when they are actively engaged in the assessment process.

Teacher assessment literacy incorporates teacher's knowledge of the subject matter and how the teacher could transform such knowledge in order to improve students' performance (including thinking skills, manipulative skills, attitude and emotions) in mathematics. Oluwatayo and Bandele (2013) defines assessment literacy as the knowledge and skills acquired by a teacher to identify and use the appropriate assessment techniques to gather accurate evidence of students' learning. Thus, assessment literacy of teachers is very vital to the overall performance of students in any academic task, especially Mathematics. Little wonder, Deneen and Brown (2016) strongly affirmed that any teacher (irrespective of the status) that refuses to update his/her knowledge of assessment techniques is committing a professional suicide.

Since it has been proven that a good assessment improves students' achievement and provide skilled teacher direction (Stiggins, 2004), emphasis should then be laid on the quality of assessment training received by the teachers. This is due to the fact that the training received by a teacher on

classroom assessment may likely influence the assessment techniques exhibited by such teacher. This tends to improve teacher assessment literacy. The process of becoming assessment literate is transformative, conscious – evoking one, as noted by Xu and Brown (2017). However, it is quite unfortunate that many pre – service teacher education programmes hardly provide the needed expertise for effective classroom assessment. Greenberg and Walsh (2012) noted that colleges only offer a one – semester course that provides a general introduction to assessment. The resultant effect is that teachers' knowledge on classroom assessment may be narrow and thus, be incompetent in terms of assessment literacy. Pedagogically, teachers, irrespective of their gender or years of teaching experience, are expected to be assessment literate so as to be able to select the appropriate source of information, ensure accurate judgements and also determine the purpose of assessment (Bandele & Oluwatayo, 2013).

It appears there are problems associated with mathematics teachers' assessment literacy. Teachers' knowledge of assessment techniques appears to be narrow and restrictive; and this is preventing the teachers from having accurate and comprehensive information about the students. Teachers do not use the right assessment technique to obtain the right information from students and this is affecting the performance of students in mathematics. The study determined the level of assessment literacy of mathematics teachers. The study also investigated the exposure of mathematics teachers to assessment training. The study further examined the influence of gender and years of teaching experience on assessment literacy of mathematics teachers.

Research Questions

The following research questions were raised for the study:

1. Are mathematics teachers exposed to classroom assessment training?
2. What is the level of assessment literacy possessed by mathematics teachers?

Research Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. Gender has no significant influence on mathematics teachers' assessment literacy.
2. Years of teaching experience have no significant influence on mathematics teachers' assessment literacy.

Methodology

The study employed the descriptive research of survey type in order to describe the assessment literacy of mathematics teachers in public secondary schools in Southwest, Nigeria. Participants were 700 mathematics teachers selected from 198 public secondary schools in Ekiti, Oyo and Lagos States using the multistage sampling technique. A self developed instrument tagged 'Mathematics Teachers Assessment Literacy Test' was used for data collection. The instrument is in two sections: section A dealt with the bio-data of the respondents including gender (male/female), years of teaching experience, number of times exposed to assessment training. Section B contained 30 multiple choice items on teachers' knowledge of various assessment techniques. The reliability coefficient of section B was estimated at 0.69 using Kuder – Richardson 21 (KR_{21}) formula. Data collected were analyzed using frequency counts, percentages, mean scores, t - test and Analysis of

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Variance (ANOVA).

Results

Question 1: Are mathematics teachers exposed to classroom assessment training?

Data were analyzed using frequency counts and percentages as presented in Table 1.

Table 1: Frequency Counts and Percentages of Mathematics Teachers In – service Classroom Assessment Training

Variables	**Frequency**	**Percentage**
Teachers with in – service exposure to classroom assessment training	679	97.0
Teachers without in – service exposure to classroom assessment training	21	3.0
Total	700	100.0

Table 1 shows that 679 teachers representing 97% indicated their exposure to in – service assessment training while 21 teachers representing 3% indicated non – exposure to in – service classroom assessment training. This implies that substantial percentage of mathematics teachers had exposure to in – service training on classroom assessment.

Question 2: What is the level of assessment literacy of mathematics teachers?

The level was categorized into 'high', 'moderate' and 'low' using mean and standard deviation of the scores in Assessment Literacy Test. Respondents who scored 0-7 of the total score on classroom assessment literacy were categorized into "Low" literacy level while those who scored 8 – 15, 16 and above of the total score were grouped into "Moderate" and "High" literacy levels respectively. The highest boundary of each of the intervals was determined using the mean score of 10.9 and standard deviation of 3.9. The highest interval of the low level was obtained by 10.9 – 3.9 = 7. The highest interval for the moderate level was obtained by 10.9 + 3.9 = 14.8 and this was approximated to 15.The frequency counts and percentages of the categories are as presented in Table 2.

Table 2: Level of Mathematics Teachers' Assessment Literacy

Levels	**Scores**	**Frequency**	**Percentage**
High	16 - 30	68	9.7
Moderate	8 - 15	159	22.7
Low	0 - 7	473	67.6
Total		700	100.0

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Table 2 shows that 68 teachers representing 9.7% of the total sample had high level of assessment literacy, 159(22.7%) had moderate level while 473(67.6%) had low level of assessment literacy. This implies that the assessment literacy of mathematics teachers is low.

Hypothesis 1: Gender has no significant influence on assessment literacy of mathematics teachers

Scores relating to assessment literacy were computed using Item 1-30 of Mathematics Teachers Assessment Literacy Test. These scores were compared for statistical significance using t-test at 0.05 level based on gender. The result is presented in Table 3.

Table 3: t-test teachers' assessment literacy by gender

Sex	N	Mean	SD	Df	t	p
Male	262	11.42	5.20	698	1.344	0.180
Female	438	10.92	4.49			

p>0.05

Table 3 reveals that there is no significant difference between the assessment literacy of male and female teachers (t=1.344, p>0.05).

Hypothesis 2: Years of teaching experience have no significant influence on assessment literacy of mathematics teachers

Scores relating to assessment literacy were computed using Item 1-30 of Mathematics Teachers Assessment Literacy Test. These scores were compared for statistical significance using Analysis of Variance (ANOVA) statistics at 0.05 level based on years of teaching experience of Mathematics teachers. The result is presented in Table 4.

Table 4: Mathematics teachers' assessment literacy by years of teaching experience

Source	SS	df	MS	F	p
Between Groups	2.394	2	1.197	.080	.923
Within Groups	10449.290	697	14.992		
Total	10451.684	699			

p>0.05

Table 4 reveals the years of teaching experience of a mathematics teacher will not significantly influence his/her assessment literacy skills ($F_{2,697}$=0.080, p>0.05).

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Discussion

The findings from this study showed that over 90% of the mathematics teachers had exposure to classroom assessment training. This is quite interesting but unfortunately the outcome of the training did not reflect in their performance in the assessment literacy test designed for the study. The deduction that one could make from this is that mathematics teachers were only trying to cover up their deficiencies in assessment literacy but blindly indicated their participation in assessment literacy skills. This result tallies with the findings of Koloi- Keaikitse (2011) that teachers were unsure about the adequacy of their assessment training, but indicated that they needed further training in assessment. In the present study, there was indication of assessment training but the results in assessment literacy nullified the teachers' claim as over 67% of them scored lowly in Assessment Literacy Test.

Results in table 3 showed that gender had no significant influence on assessment literacy of mathematics teachers. This result is at variance with that of Alsarimi (2010), Alkharusi, et al (2012) and Mohiuddin (2015) who found that gender had significant influence on assessment literacy of teachers in favour of the male. The present study however holds that if assessment techniques are not emphasized during assessment training, both gender would be almost at the same level in assessment literacy as could be seen in the result of this study.

Years of teaching experience of mathematics teachers had no significant influence on their assessment literacy. Teachers with teaching experience of years ranging from eight years and above are expected to possess high assessment literacy level but the performance of teachers in the Assessment Literacy Test showed that teachers are relatively at the same level. This result also support the assertion made by Alsarimi (2010) that the years of teaching experience of teachers did not influence their assessment literacy.

Conclusion

From the findings of the study, it could be concluded that mathematics teachers' assessment literacy is low despite their claim that they had training on classroom assessment. Also, teacher assessment literacy is not influenced by gender and years of teaching experience.

Recommendations

1. There is need for regular training of mathematics teachers on classroom assessment to foster their level of literacy. This will widen their knowledge and expose them to various classroom assessment techniques. It will also promote quality assurance in mathematics lessons.

2. Teachers should be encouraged to equip themselves with various assessment techniques using relevant textbooks and the internet so as to bridge the gap between teacher assessment literacy and the training received on assessment.

3. Mathematics teachers should be trained freely irrespective of gender and years of teaching experience in order to have in – depth knowledge on classroom assessment techniques.

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Time Management and Work Environment as Correlates of Lecturers' Productivity in Colleges of Education in Osun State

Author(s), ODEDIJI, Kehinde Morufdeen

Abstract:

The study examined time management and work environment as correlates of lecturers' productivity in Colleges of Education in Osun State. Specifically, the study examined the relationship between time management and lecturers' productivity; and work environment and lecturers' productivity in Colleges of Education. The descriptive research of the survey type was adopted in this study. The sample size for this study was 140 respondents selected from two Colleges of Education in Osun State using multistage sampling procedure. The data for this study were collected through the use of two sets of self – designed questionnaire tagged Time Management and Work Environment Questionnaire (TMWEQ) and Lecturers' Productivity Questionnaire (LPQ). The face and content validity of the instruments (TMWEQ and LPQ) were validated by specialists in Educational management as well as Tests and Measurement experts. A reliability coefficient of 0.81 was obtained for Time Management and Work Environment Questionnaire (TMWEQ) and 0.85 was obtained for the Lecturers' Productivity Questionnaire (LPQ). The responses obtained were collated and analysed using descriptive and inferential statistics. The findings of the study revealed that time management and work environment were related to lecturers' productivity in Colleges of Education. It was recommended among others that Colleges of Educational management should place more emphasis on improving the work environment of lecturers through provision of modern facilities, conducive office, teaching resources among others.

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Introduction

Colleges of Education, like any other tertiary institutions relies on its employees who work to stir up the activities of the organization in order to achieve its objectives. These employees are regarded as most important and tangible assets in the organization (Onyeizugbe & Orogbu, 2015). It is a popular knowledge that no institution will grow beyond the quality of human resources that constitute the teaching and non-teaching staff. This is because productivity lies within the employees' ability and commitment as well as initiatives to improve the sustainability of the institution, which are often ratified by management (Maha, 2015).

Productivity is the measurement of actual output or result against set goals (Kazimoto, 2016). According to the framework for measuring the lecturers' productivity, it is measured based on his/her research output, quality of teaching, community services among others. Lecturers are the greatest assets as well as major stakeholders in the Colleges of Education. Their main duty is to teach and bring up the young generation of students to acquire health related skills and knowledge for growth and development. Teaching is a difficult task and demands serious commitment to be effective.

Lecturers' productivity in Colleges of Education can be considered as the teaching of the students, amount of research conducted, community services rendered by the staff. In support of this, Goodall (2013) posited that research is one of the focal points on which the tertiary education rests while others include teaching and community service. Research productivity of lecturers is mainly disseminated through publication and this earns the staff local and global recognition.

The researcher observed that lecturers' productivity in Colleges of Education appears to be very low. It appears some lecturers of Colleges of Education no longer place priority on their primary role, which is teaching. In the aspect of teaching, the researcher observed that some lecturers appear not to be punctual in classroom while some who are punctual do not go to classroom to teach. It was observed that some lecturers no longer use instructional materials for teaching while some appear not to have good mastery of the subject matter.

Research publication seems to be considered as one of the major determinants of lecturers' productivity. The principal criterion for promoting lecturers from one level to the other is research output or publications in referred national and international journals and text books. However, the researcher observed that most lecturers in Colleges of Education do not conduct independent study for publication. Some lecturers have been observed not to render selfless consultancy services to communities and agencies among others. The importance of teaching, research, and community services cannot be overemphasised among lecturers in Colleges of Education.

The observed low lecturers' productivity in Colleges of Education could be attributed to so many factors among which are poor work environment and time mismanagement. The extent of lecturers' productivity in their primary responsibility most often may not be guaranteed in the face of time mismanagement and poor work environment.

Time is a precious good to both employees and employers in a modern organization. Time management has been defined as cluster of behavioural skills sets that are important in an organization (Abu, 2015). Time is one of the resources that lecturers need to manage efficiently in order to be productive. The lecturers who coordinate the activities of students must be able to manage his time very well in order to accomplish the stated aims and objectives. Time represent the human age in general, a critical resource in management, the ability to manage time and organize it is the key to success for any business.

Time management depends on the ability of a person to analyze his time and knowledge of where

and how he spends and the leader who cannot manage his time cannot manage anything else (Omar, 2016). Time management skills include activities performed by lecturers such as planning in advance, lectures preparations and prioritizing. Omar (2016) also opined that time management skills require four basic steps: decide what you want to accomplish; determine activities to reach each goal; make a daily 'to do' list; and set one's priorities every day.

Time management is actually a form of self-management as it requires and enables lecturers to control or manage events. Time management thus requires the right decision at the right time and is one of the basic requirements of personal and professional success. Time Management is one of the branches of educational management that is interested in investing time and making use of it as efficiently and efficiently as possible, reducing the chances of wasting it and exploiting it by increasing the productivity of workers at a specific time (Abu, 2021).

It has been however observed that the most common difficulties encountered by some lecturers in Colleges of Education are their inability to organize and plan their work properly. It is not uncommon to see lecturers usually coming late to work when there are pressing issues waiting for them in their offices. It has also been observed by the researcher that some lecturers attend to issues that should have been handled after their official hours at work. Such issues include unnecessary personal phone calls, wasting much time with visitors, involving in routines that should have been delegated.

Work environment can be referred to as elements within the work place, such as management style, inter- relationship among staff and opportunity to develop oneself. An improved work environment could result in a reduction in a number of complaints and absenteeism and will bring an increase in productivity. Work environment can be perceived as those processes, systems, structures, tools or conditions in the workplace that influence favourably or unfavourably individual employee performance. In addition, work environment encompasses policies, rules, culture, resources, working relationships, work location, and internal and external environmental factors, all of which influence the ways employees perform their job functions (Famade, et al., 2016).

Teachers use about 40 percent of their existence within work environments, which extremely affect their status of mind, aptitudes, and actions in addition to their productivity (Bukola & Owolabi, 2015). An understanding of the effect of work environment on the productivity of lecturers cannot be over-emphasized or seen as overstatement in every organization. Experience has shown that workers are directly influenced by the environment they find themselves in terms of productivity if the environment is not conducive. However, poor work environment has posed a great danger to workers health and therefore make them to work with less joy and enthusiasms and work progress is hampered and disrupted.

The absence of important of work materials as a result of non-availability of some necessary office facilities like air condition, rugs or tiles, good ventilation in some of the department in Colleges of Education is a common feature of poor work environment. Some offices or departments look depressing and unstimulating. Some of them have no louvers, light and some with uncompleted roofs. The state of affairs seems not compete favourably with offices found in Universities and other tertiary institutions, some of the offices are with dirty and scattered environment, most of the departments have small floor space with materials tables, chairs, papers, files and other things scattered here and there.

It appears that if an organization provides its employees with better work and most conducive working environment they will perform exceptionally well with enhanced productivity. However, the researcher observed that the work environment of lecturers in Colleges of Education seem not

to be conducive. There are situations whereby four to five lecturers shares the same office. There are inadequate infrastructures needed in the office, like table, chairs and other materials. Aside the facility aspect, policies that are not too workers' friendly are usually set by management. The researcher observed that some lecturers usually complain about their work environment as one of the factors affecting their productivity.

The problem of the study is to examine how time management and work environment are related to lecturers' productivity in Colleges of Education in Osun State. The study examined time management and work environment as correlates of lecturers' productivity in Colleges of Education in Osun State. Specifically, the study examined:

i. the relationship between time management and lecturers' productivity in Colleges of Education; and
ii. the relationship between work environment and lecturers' productivity in Colleges of Education.

Research Hypotheses

The following hypotheses were generated to guide the study:

1. There is no significant relationship between time management and lecturers' productivity in Colleges of Education in Osun State.
2. There is no significant relationship between work environment and lecturers productivity in Colleges of Education in Osun State.

Research Method

The descriptive research of the survey type was adopted in this study. The population for the study was all the lecturers in Colleges of Education in Osun State. The sample size for this study was 140 respondents selected from two Colleges of Education in Osun State. The sample was selected using multistage sampling procedure and three stages were involved.

The data for this study were collected through the use of two sets of self – designed questionnaire. The first one is tagged Time Management and Work Environment Questionnaire (TMWEQ) which was administered on the lecturers. It consisted of two sections A and B. Section A sought for the socio-demographic characteristics of the respondents while section B consisted of 20 items on time management and work environment. The items in the questionnaire were on a 4-point likert type scale with four options ranging from Strongly Agree to Strongly Disagree: Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1).

The second one tagged Lecturers' Productivity Questionnaire (LPQ) was administered on the Head of Department of each of the lecturers. It comprises three sections A, B and C Section A contains items on the bio – data of the Heads of Departments. Section B contained items on the bio – data of the lecturers to be assessed and was completed by the researcher while section C consisted of 20 items which elicited information on job productivity. The items in the questionnaire were on a rating scale with five options ranging from Excellent to Poor: Excellent (5), Very Good (4), Good (3), Fair (2) and Poor (1).

The face and content validity of the instruments (TMWEQ and LPQ) were validated by specialists in Educational management as well as Tests and Measurement experts. The instruments were said to have facial relevance and concerned with the subject matter it claimed to measure. The reliability of the instruments was carried out using the test re-test method. The Time Management and Work Environment Questionnaire (TMWEQ) was administered twice within an interval of two weeks on 20 lecturers in a College of Education that will not be included in the sampled Colleges of Education for the study while Lecturers' Productivity Questionnaire (LPQ) was administered twice within an

interval of two weeks on Heads of Departments of the selected 20 lecturers. The instruments were administered twice within a period of two weeks. The scores from the two sets of responses were correlated using Pearson Product Moment Correlation analysis to obtain the reliability coefficients of the instruments. A reliability coefficient of 0.81 was obtained for Time Management and Work Environment Questionnaire (TMWEQ) and 0.85 was obtained for the Lecturers' Productivity Questionnaire (LPQ). The coefficients were considered high enough for the reliability.

The responses obtained were collated and analysed using descriptive and inferential statistics. Hypotheses 1 – 2 were tested using Pearson's Product Moment Correlation (PPMC). All the hypotheses formulated were tested at 0.05 level of significance.

Results

Ho1: There is no significant relationship between time management and lecturers' productivity in Colleges of Education in Osun State.

In testing this hypothesis, data on time management were collected from the responses of the respondents to items under Section B of TMWEQ (item 1 – 10) in the questionnaire. Data on lecturers' productivity were collected from the responses of the respondents to items under Section C of LPQ (item 1 – 20) in the questionnaire. Both were compared for statistical significance using Pearson Product Moment Correlation at 0.05 levels. The result is presented in table 1.

Table 1: Relationship between time management and lecturers' productivity

Variables	N	Mean	Stand Dev	r-cal	P-value
Time Management	140	29.37	2.78	0.428*	0.000
Lecturers' Productivity	140	71.20	4.19		

*P<0.05

Table 1 showed that the r-cal value of 0.428 is significant at 0.05 level of significance because the P-value (0.000) < 0.05. The null hypothesis is rejected. This implies that there is significant relationship between time management and lecturers' productivity in Colleges of Education in Osun State. Time management is moderately and positively related to lecturers' productivity.

Ho2: There is no significant relationship between work environment and lecturers productivity in Colleges of Education in Osun State.

In testing this hypothesis, data on work environment were collected from the responses of the respondents to items under Section B of TMWEQ (item 11 – 20) in the questionnaire. Data on lecturers' productivity were collected from the responses of the respondents to items under Section C of LPQ (item 1 – 20) in the questionnaire. Both were compared for statistical significance using Pearson Product Moment Correlation at 0.05 levels. The result is presented in table 2.

Table 2: Relationship between work environment and lecturers' productivity

Variables	N	Mean	Stand Dev	r-cal	P-value
Work Environment	140	24.17	2.05	0.571*	0.000
Lecturers' Productivity	140	71.20	4.19		

*P<0.05

Table 2 showed that the r-cal value of 0.571 is significant at 0.05 level of significance because the P-value (0.000) < 0.05. The null hypothesis is rejected. This implies that there is significant relationship between work environment and lecturers' productivity in Colleges of Education in Osun State. Work environment is moderately and positively related to lecturers' productivity.

Discussion

The findings of the study revealed that there was significant relationship between time management and lecturers' productivity in Colleges of Education in Osun State. The implication of this finding is that proper time management will positively influence productivity of lecturers in Colleges of Education. In consonance with this finding, Sarpong – Nyavor (2012) revealed that there was a positive relationship between planning and employees' performance. Omenu (2015) concluded that setting priorities as a time management skill influenced productivity. Khan, Khan, Din and Khan (2016) concluded that time management could improve job productivity.

The findings of the study also revealed that there was significant relationship between work environment and lecturers productivity in Colleges of Education in Osun State. Ojogwu and Alutu (2009) and Olatunji (2013) alluded that for proper teaching and learning to take place, there must be adequate infrastructure and in many schools in Nigeria, the facilities provided for most departments are grossly inadequate for teachers or practicals, some teachers have no offices, the classroom spaces are small and do not permit meaningful interaction between the teachers and the students which makes the academic environment unhealthy, with decayed, dysfunctional, and dilapidated infrastructural facilities. The study of Owoeye and Olatunde (2011) established that school environment were the most potent determinant of job productivity.

Idemobi and Onyeizugbe (2011) concluded that work environment has significant effect on employees' performance and productivity. Bukola and Owolabi (2015) posited that teachers are not expected to be effective or perform at high level in the area of curriculum without the adequate basic infrastructure and facilities for teaching and learning.

Conclusion

Based on the findings of this study, it is concluded that time management and work environment are determinants of lecturers' job productivity.

Recommendations

Based on the findings of this study, the following recommendations were made.

1. Colleges of Educational management should place more emphasis on improving the work environment of lecturers through provision of modern facilities, conducive office, teaching resources among others.
2. Lecturers should improve on their time management as this could go a long way improve job productivity
3. Job productivity of lecturers should be annually appraised and proper feedback should be given back to them so as to know the areas improvements are needed.

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Non-Availability and Integration of ICT Devices in Literacy Centres: Implication to Adult Learning in Ekiti State

Author(s), ADEBO, Damian Kehinde

Abstract:

The study investigated non-availability and integration of ICT devices in literacy centres in Ekiti state. Specifically, the study examined the level of availability and extent of ICT devices in literacy centres in Ekiti State; and the challenges faced using this ICT tools for learning in the literacy class. The descriptive research of the survey type was adopted in this study. The population consisted of all adults who are students in literacy centres in Ekiti state. The sample for this study consisted of 90 adults who are students in literacy centres in Ekiti state. The sample was selected using purposive sampling techniques. ICT Devices Questionnaire (ICTDQ) was used to collect relevant data for the study. Descriptive statistics such as frequency count, simple percentages, mean and standard deviation were used to analyze the research questions. The findings of this study revealed that that level of availability and extent of utilization of ICT devices in literacy centres in Ekiti State were low. The challenges faced using ICT tools for learning in the literacy class are inadequate ICT devices; irregular electricity hampering the utilization of available ICT tools for learning; lack of ready access to internet; lack of required technical support; and shortage of facilitators in the appropriate use of ICT to enhance teaching and learning process in the literacy centre. It was recommended among others that Government should equip adult literacy centres with adequate ICT devices. Also Facilitators of adult programme should endeavour to incorporate and prioritise the use of ICT in teaching and learning process.

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Introduction

Adult education is the group of schooling activities available for people who for diverse reasons did not study or who dropped out early. The aim is to provide people with opportunities to overcome their living conditions by enhancing different practical skills that can be used in the work place or in future life experiences. Adult education is expected to address the socio-economic, cultural, political and environmental problems besieging humanity in their various societies. This is so because adults are the major occupants of the production sectors of the economy. In spite of the global recognition of the importance of adult education to both individual and the nation at large, a substantial number of people are still illiterate. Some lack literacy skills because they have not had the opportunity or the means to attend school and some others because their schooling was cut short or was of poor quality.

The use of computers in education have ended up as a significant instrument and innovatively affected how we learn and see the world in broad. Today, the place of ICTs in education cannot be quantified. Modern instructional techniques required the use of ICT which provide a more simplified and reliable teaching and learning methodologies. Students can adjust their learning paces with immediate feedback and self-assessment in an institution where the new technologies are being used. Such students extend their learning capabilities beyond classrooms as they can communicate with peers from everywhere around the globe.

Onyekwe (2006) saw ICT as a broad based electronic technology that is used for collecting, storing, processing and transmitting information in various forms. ICT is, therefore, technology that generally supports the individual's ability to manage and communicate information electronically. Thus, for adults not to be left out in what is happening in the world, they to key in into the use and application of this technology and this can only be achieved through the integration of ICT into adult education in Nigeria.

The advent and increasing availability of information and communication technologies (ICTs) have impacted meaningfully in every sphere of human endeavour and have significantly changed the practices and processes of virtually all forms of activities as people now have better access to information far ever than before (Dighe, 2008). The adoption of ICT in adult education has a multiplier effect especially in the area of enhancing learning process. It provides learners with a new set of skills which make them globally competitive.

ICTs foster the acquisition and easy absorption of information that gives adult learners the unparalleled prospects to expand their educational pursuit. Empirical evidence has shown that ICT is of immeasurable value to literacy as it constitutes a vibrant force for widening adult learners' access and participation in literacy programmes, facilitate a flexible learning in terms of time and distance and ultimately serve as an indispensable instrument for a lifelong learning process (Jimoyiannis & Gravani, 2011).

The compelling usage of ICT in instruction and learning relies on upon the accessibility of these facilities and the educators' capability in utilizing them. Observation has shown that there are limited functional ICT facilities in most adult literacy centers especially those in the rural areas. This in turn hinders the urge to use them by the adult learners for learning. Also lack of adequate computer literate from the site of instructors, sporadic power supply and insufficient financial support seem to be another set of deterrent militating against successful usage of ICT facilities and resources in adult literacy centers.

The integration of ICT in adult education may face various challenges with respect to policy, planning, infrastructure, learning content and language, capacity-building and financing (Fasakun,

2006). ICT – enhanced adult education requires clearly stated objectives for mobilization of resources and political commitment of the concerned bodies (Igbo, 2008). With respect to challenges of capacity building, some adult educators lack professional training facilities for them to be ICT skilled and computer literate. In fact, one impeding factor of ICT integration in adult education is the skill gap of the people implementing it (Nnazor, 2005). Another great challenge is that financing ICT in adult education programmes requires large capital investment.

The researcher observed that most adult education centres are not equipped with ICT gadgets and tools, computers, internet facilities, assistive technologies like Braille for the virtually improved, mobile wheel chairs for the handicapped adults, among others as a result of huge capital involved. In view of the above, the study investigated non-availability and integration of ICT devices in literacy centres in Ekiti state. The study specifically examined:

1) the level of availability of ICT devices in literacy centres in Ekiti State;
2) how often Adult Educators utilize the available ICT devices in literacy centres in Ekiti State; and
3) the challenges faced using this ICT tools for learning in the literacy class.

Research Questions

The following research questions are raised for this study

1) What is the level of availability of ICT devices in literacy centres?
2) How often do the Adult Educators utilize the available ICT devices in literacy centres in Ekiti State?
3) What are the challenges faced using this ICT tools for learning in the literacy class?

Research Method

The descriptive research design of the survey type was adopted in the study. The design was considered appropriate because this approach allows information to be obtained from a representative sample of the population in the actual situation as they exist. A survey research studies a small sample from a large population from where inferences would be draw about the characteristics of the defined population.

The population consisted of all adults who are students in literacy centres in Ekiti state. The sample for this study consisted of 90 adults who are students in literacy centres in Ekiti state. The sample was selected using purposive sampling techniques.

The study made use of structured questionnaire titled "ICT Devices Questionnaire (ICTDQ)" which was divided into three sections. Section A of the questionnaire captured the demographic characteristics of respondents; section B consisted of 30 items on the availability and extent of utilization of ICT devices in literacy centres while section C consisted of 10 items on the challenges faced using this ICT tools for learning in the literacy class.

The face and content validity was ascertained by giving the designed questionnaire to experts of Tests and Measurement for vetting before distributing it to the respondents. The reliability of the instrument was determined through the test-retest method. A trial test was carried out outside the sampled area. The instrument was administered on ten respondents while the data collected on the two tests were correlated using Pearson's Product Moment Correlation statistics which yielded a co-efficient of 0.75

The researcher personally administered the instrument in each of the institution sampled in the study. The researcher was responsible for the administration and collection of the instrument from the respondents. Descriptive statistics such as frequency count, simple percentages, mean and standard deviation were used to analyze the research questions.

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Results

Research Question 1: What is the level of availability of ICT devices in literacy centres?

Frequency counts, percentages, mean and standard deviation score were used to illustrate the responses to items 1 – 30 in section B of ICTDQ. To determine the level of availability of ICT devices in literacy centres (low, moderate and high), the mean score and standard deviation of the responses were used. The low level of availability of ICT devices in literacy centres was determined by subtracting the standard deviation from the mean score (44.63 – 2.17 = 42.46). The moderate level of availability of ICT devices in literacy centres was determined by the mean score (44.63) while the high level of ICT devices in literacy centres was determined by adding the mean score and standard deviation (44.63 + 2.17 = 46.80). Therefore, low level of availability of ICT devices in literacy centres starts from 30.00 to 42.46, the moderate level starts from 42.47 to 46.79 and the high level of availability of ICT devices in literacy centres is from 46.80 to 60.00. The level of availability of ICT devices in literacy centres in Ekiti State is presented in table 1 and figure i.

Table 1: Level of Availability of ICT devices in literacy centres

Levels of availability	No of Respondents	Percentage
Low (30.00 – 42.46)	52	57.78
Moderate (42.47 – 46.79)	24	26.67
High (46.80 – 60.00)	14	15.56
Total	**90**	**100**

Table 1 revealed the levels of availability of ICT devices in literacy centres in Ekiti State. The result showed that out of 90 respondents, 52 representing 57.78% agreed that there is low level of availability of ICT devices in literacy centres. Respondents who agreed that availability of ICT devices in literacy centres is at moderate level were 24 respondents representing 26.67% while only 14 respondents representing 15.56% agreed that availability of ICT devices in literacy centres is high. This showed that the level of availability of ICT devices in literacy centres in Ekiti State was low. Figure i further revealed the level of availability of ICT devices in literacy centres.

Figure i: Level of availability of ICT devices in literacy centres in Ekiti State

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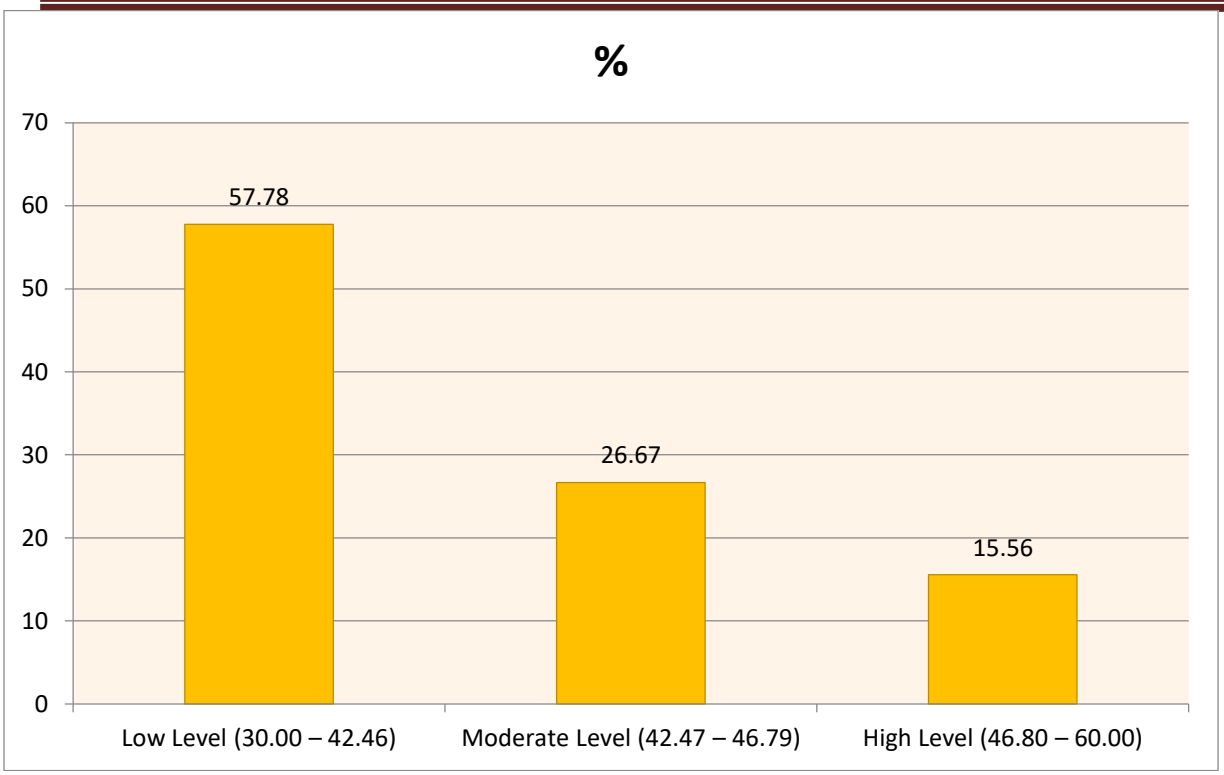


Research Question 2: How often do the Adult Educators utilize the available ICT devices in literacy centres in Ekiti State?

Frequency counts, percentages, mean and standard deviation score were used to illustrate the responses to items 1 – 30 in section B under extent of utilization of ICT devices in literacy centres in Ekiti State. To determine the extent of utilization of ICT devices in literacy centres in Ekiti State (low, moderate and high), the mean score and standard deviation of the responses were used. The low extent of utilization of ICT devices in literacy centres was determined by subtracting the standard deviation from the mean score (68.42 – 5.53 = 62.89). The moderate extent of ICT devices in literacy centres was determined by the mean score (68.42) while the high extent of ICT devices in literacy centres was determined by adding the mean score and standard deviation (68.42 + 5.53 = 73.95). Therefore, low extent of ICT devices in literacy centres starts from 30.00 to 62.89, the moderate level starts from 62.90 to 73.94 and the high extent of ICT devices in literacy centres is from 73.95 to 90.00. The extent of ICT devices in literacy centres in Ekiti State is presented in table 2 and figure ii.

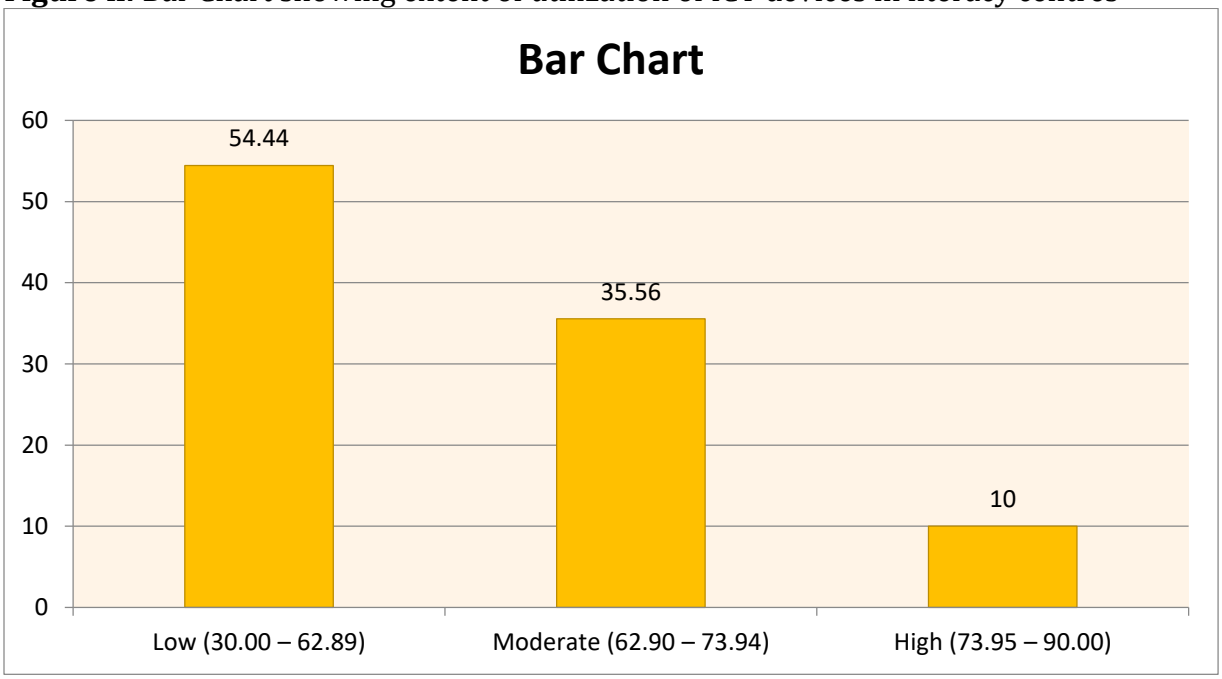
Table 2: Extent of Utilization of ICT devices in literacy centres in Ekiti State

Extents of Utilization	No of Respondents	Percentage
Low (30.00 – 62.89)	49	54.44
Moderate (62.90 – 73.94)	32	35.56
High (73.95 – 90.00)	9	10.00
Total	**90**	**100**

Table 2 revealed the extents of utilization of ICT devices in literacy centres in Ekiti State. The result showed that out of 90 respondents, 49 respondents representing 54.44% had low extent of utilization of ICT devices in literacy centres. Respondents who agreed that utilization of ICT devices

in literacy centres is at moderate extent were 32 respondents representing 35.56% while only 9 respondents representing 10.00% agreed that utilization of ICT devices in literacy centres is high. This showed that the extent of utilization of ICT devices in literacy centres in Ekiti State was low. Figure ii further revealed the extent of utilization of ICT devices in literacy centres.

Figure ii: Bar Chart showing extent of utilization of ICT devices in literacy centres



Research Question 3: What are the challenges faced using ICT tools for learning in the literacy class?

Table 3: Descriptive analysis of challenges faced using ICT tools for learning in the literacy class

S/N	Items	N	Mean	S.D.	Remark
1	Inadequate ICT devices	90	3.42	0.61	Accepted
2	Irregular electricity hampering the utilization of available ICT tools for learning	90	3.11	0.63	Accepted
3	Lack of ready access to internet	90	2.85	0.69	Accepted
4	The use of ICT tools in the literacy class consumes time more than traditional method	90	2.19	0.75	Rejected
5	Lack of required technical support	90	2.99	0.65	Accepted
6	Shortage of facilitators in the appropriate use of ICT to enhance teaching and learning process in the literacy centre	90	3.17	0.59	Accepted
7	Lack of adequate training of staff on computer usage		2.43	0.78	Rejected

Mean Cut-off: 2.50

Table 3 revealed the challenges faced using ICT tools for learning in the literacy class. The table revealed that item 4 and 7 with mean mark of 2.19 and 2.43 respectively were rejected because it is less than the mean cut-off of 2.50. It can be concluded that the challenges faced using ICT tools for learning in the literacy class are: inadequate ICT devices; irregular electricity hampering the

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utilization of available ICT tools for learning; lack of ready access to internet; lack of required technical support; and shortage of facilitators in the appropriate use of ICT to enhance teaching and learning process in the literacy centre.

Discussion

The result of this study also showed that the level of availability of ICT devices in literacy centres in Ekiti State was low. This implies that ICT devices were not adequate for the implementation of Adult Education Programme. Most facilitators in literacy centres have been teaching without the ICT devices. This present finding is in consonance with the findings of Adeyemo, Adedoja & Adelore (2012) who concluded that there is lack of adequate and appropriate ICT devices for effective teaching in literacy centres.

The study also revealed that the extent of utilization of ICT devices in literacy centres in Ekiti State was low. This finding might be due to non-availability or low availability of ICT devices in most of our adult literacy centres. This implies that the ICT devices not available could not be utilized by adult educators. This finding agreed with the conclusion of Fasakun (2006) and Nwabuko (2004) who concluded that the lack of ICT devices in our literacy centres have constituted a cog in the wheel of adequate implementation of the Adult education programmes.

The study also revealed that the challenges faced using ICT tools for learning in the literacy class are: inadequate ICT devices; irregular electricity hampering the utilization of available ICT tools for learning; lack of ready access to internet; lack of required technical support; and shortage of facilitators in the appropriate use of ICT to enhance teaching and learning process in the literacy centre. All these challenges pose a threat to the effective utilization of ICT to mediate teaching and learning process in adult literacy programmes.

Conclusion

Based on the findings of this study, it is concluded that level of availability and extent of utilization of ICT devices in literacy centres in Ekiti State were low. The challenges faced using ICT tools for learning in the literacy class are inadequate ICT devices; irregular electricity hampering the utilization of available ICT tools for learning; lack of ready access to internet; lack of required technical support; and shortage of facilitators in the appropriate use of ICT to enhance teaching and learning process in the literacy centre.

Recommendations

Based on the findings of this study, the following recommendations were made.

1. Government should equip adult literacy centres with adequate ICT devices
2. Facilitators of adult programme should endeavour to incorporate and prioritise the use of ICT in teaching and learning process.
3. Government should enforce the use of ICT devices in literacy centres as ICT use have the potentials to elicit and sustain adult learners' interest in literacy programmes and thus reduce the level of drop-out usually witnessed in adult literacy programme
4. Government and facilitators should work with every sense of purpose to reduce the challenges faced using these ICT devices in adult literacy programmes

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Interactive Effect of Gender and Two Teaching Strategies On Pre-Service Teachers' Performance in Basic Science in Nigerian Colleges of Education

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Abstract:

The study investigated interactive effect of gender and teaching strategies (Reflective Teaching, Peer Tutoring and Conventional Teaching) on the performance of pre-service teachers in Basic Science. The study adopted pre-test and post-test control group quasi-experimental design. The population of the study consisted of all pre-service teachers studying Basic Science as teaching subject in all the 12 public Colleges of Education in Southwest, Nigeria. The sample for the study consisted of 124 pre-service teachers of Basic Science from the three selected Colleges of Education in Southwest, Nigeria through multistage sampling procedure. Pre-service Teachers' Achievement Test in Basic Science (PTATBS) was used for data collection and divided into two sections A and B. The face and content validity of PTATBS was ensured by experts of Basic Science. The method of split-half was used to establish the reliability coefficient 0.81 for PTATBS as administered on 40 pre-service teachers outside the sampled area. The experimental procedure was in three phases. Inferential statistics of two-way Analysis of Variance (ANOVA) was used to test the formulated hypotheses at 0.05 level of significance. The findings of the study revealed that the performance of the pre-service teachers exposed to Reflective Teaching, Peer Tutoring and Conventional Teaching was not influenced by their gender. The use of Reflective Teaching and Peer Tutoring instructional strategies should be encouraged in teaching pre-service teachers of Basic Science in Colleges of Education to enhance their professional skills since the strategies are not gender biased.

Keywords: Basic Science, Gender, Peer Tutoring, Performance, Pre-service Teachers, Reflective,

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Introduction

The importance of a teacher in any educational setting cannot be overemphasized as they are the pivot on which the system hinges. It is obvious that for Colleges of Education in Nigeria to produce teachers, who possess knowledge and classroom skills that would remain in the teaching profession and influence students' performance positively. College of Education students are expected to acquire adequate knowledge and perform excellently so as to fulfill the main objective of establishing the teacher training school, which is to produce quality and competent teachers for primary and junior secondary schools. Basic Science enables students to develop an understanding of application of scientific knowledge to everyday activities. It helps youngster to excel in the field related to applied science and aids systematic progress in technology.

Gender is one of the variables of interest considered to have great influence on pre-service teachers' performance in Colleges of Education in Nigeria, especially in science subjects. Gender is the range of physical, biological, mental and behavioural characteristics pertaining to and differentiating between the feminine and masculine (female and male) population. The importance of examining performance in relation to gender is based primarily on the socio-cultural differences between girls and boys. What has remained the main focus of great concern in the field of science education are the biases and misconceptions about women and science, i.e. science is a male enterprise (Erinosho, 2005). Gender has remained an issue in the front burner of academic discourse. Scholars have become enthusiastic on addressing issues that have continued to create differences among people on the basis of gender which has continued to have adverse consequences on sustainable economic development of the nation (Imam & Dada 2011). Imam and Dada (2011) defined gender as the social roles, responsibilities, and behavior created in our families, societies and culture.

It is not surprising then that the school, being a microcosm of society, consciously or unconsciously perpetuates stereotypical behaviour, and, indeed, teachers within the system exhibit gender bias in the classrooms (Arigbabu & Mji, 2010). For example, it has been reported that teachers, consciously or unconsciously, often mete out differential treatment to boys and girls in their classrooms (Rubble & Martins, 2008). Students, on their part, tend to have formed a stereotypical concept of mathematician and scientists whom they regard as a special group. In such a concept, female students (Mothers of tomorrow) do not see themselves as having the potential to become mathematicians and scientists (Arigbabu & Mji, 2010).

The greater disadvantage and under-representation of females over males in scientific and technologically-related specialties, career and even in leadership positions in Nigeria is a fact that certain factors impinging on gender equality and preference may be responsible for the seeming non-participation of females. However, this does not create any impression of poorer performance. Girls and boys are equally brilliant or equally dull (Duyilemi, 2005). The issue of gender differences needs further examination since a number of studies especially in Nigeria have reported that girls are under-represented in the fields of science and technology at secondary and tertiary institutions level (Kingdom & Cassen, 2007).

It also includes the expectations held about the characteristics, aptitudes and likely behaviors of both men and women. These roles are passed on from generation to generation (United States Aid for Individual Development (USAID), 2005). Topping et al. (2011) view gender as a social, historical and cultural construct and conditioning, indicating acceptable and preferable forms of behavior and attitudes for both men and women in the society.

Gender can also be viewed as a socially ascribed attribute which differentiates feminine from masculine. Oraifo (2000) opined that sex is based on biological and physical differences between

male and female while gender refers to cultural understanding about what constitutes masculinity and feminity in a society. Thus, while sex is biologically defined, gender is socially defined. On another note, Onyebuenyi (2009) stated that "being male or female is a matter of sex but to be masculine or feminine is a matter of gender". Gender roles are therefore not only different but unequal. Masculinity, according to Onyebuenyi refers to attributes appropriate for males such as being aggressive, athletic, physically active, logical and dominant in social relations with females. The author maintained that feminity refers to attributes and traditionally with appropriate behavior for females such as docility, fragility, emotionality and subordination to males.

According to UNESCO (2003), females constitute more than fifty percent (50%) of the world's active population and though they make immense contribution to national development, they still face a number of inequitable difficulties that limit their potentials in prompting personal and collective development. A key area of concern in this is that of their participation in science. Gender difference in science, from the views of Myra and David (1991) as cited by Sakiyo (2007) is the intentional or unintentional treatment of females in science in our educational system where boys receive significantly more remediation, criticism and praise than girls. Gender should not be allowed to restrict total development of the potentials of anybody because whatever reason that makes science attractive to males, does the same for females. Ezeliora (2002) submits that women and girls need science education for some reasons. One is that growing population is bringing and increasing pressure on natural resources and the environment. We need to find ways to use the same resources in more different ways. Another is that in this era of technological development, every profession uses the result of science and technology so the women/girls should also be prepared for it. Also, growing demoralization increasingly involves the population in decision-making and to be able to decide, women need to be able to choose.

Women in science came into limelight during the United Nations Decade for Women (1976-1985) which addressed women in science and the challenges confronting women in choosing and performing well in science related occupations (Otuka (2004). The association between gender and the response to Science, Technology and Mathematics (STM) education has been widely studied (Anegbe & Adeoye, 2006). The main focus of their findings is lack of girls opting to study the physical sciences. Studies on gender differences in science achievement, interest and participation are enormous in science education. The finding contradict that of Ezenwosu and Nworgu (2009) in their study titled, Efficacy of Peer Tutoring and Gender on Students' Achievement in Biology revealed that the influence of gender on student academic achievement in biology was not significant. Contrarily, Obiunu (2008) in his study titled the effects of Reciprocal Peer Tutoring on the enhancement of career decision making process among secondary school adolescents that indicated that sex is not a significant factor, in the career decision-making of adolescent students in the study treatment groups.

It appears that male pre-service Basic Science teachers perform better than their female counterparts (Ibidiran, 2017). Also, equality and difference in the achievement of male and female pre-service teachers in Basic Science has formed an important focus of research for some years now. The issue of gender disparity in Basic Science performance of pre-service teachers particularly was also clearly detected by Alio and Harbor (2000). It is obvious that the way students learn is as important as what they learn. This is to say that the selection of an adequate usage of an appropriate and most efficient and effective method are very vital to the success of any lesson (Iji, 2007).

Based on the foregoing, this study investigated the interactive effect of gender and two teaching strategies (Reflective Teaching and Peer Tutoring) on pre-service teachers' performance in Basic

Science in Nigerian Colleges of Education. Reflective Teaching (RT) is a teaching strategy which involves observing what you do in the classroom, thinking about why you do it, with a view to re-strategize for better performance in the classroom (Adedayo, 2014). It is a process of self-observation and self-evaluation. It is a means of professional development which begins in our classroom. It is paying critical attention to the practical values and theories which inform everyday action, by examining practice reflectively and reflexively (Adedayo, 2014). Peer Tutoring (PT) could be defined as a learning situation where students take turns acting as the tutors and the tutees for instruction or review of academic material (Ogundola, 2017). In this case, students exchange roles during tutoring session, both giving and receiving academic assistance while the teacher supervises rather than participate in the intervention. The goal of Peer Tutoring is to use discussion to enhance students' reading learning, develop self-regulatory and monitoring skills, and achieve overall improvement in motivation (Pulling & Allen, 2014).

The study specifically investigated interactive effect of gender and teaching strategies (Reflective Teaching, Peer Tutoring and Conventional Teaching) on the performance of pre-service teachers in Basic Science. The following hypotheses were formulated:

Ho1: There is no significant interactive effect of gender and teaching strategies (Reflective Teaching and Conventional Teaching) on the performance of pre-service teachers in Basic Science.

Ho2: There is no significant interactive effect of gender and teaching strategies (Peer Tutoring and Conventional Teaching) on the performance of pre-service teachers in Basic Science.

Research Method

The study adopted pre-test and post-test control group quasi-experimental design. The population of the study consisted of all pre-service teachers studying Basic Science as teaching subject in all the 12 public Colleges of Education in Southwest, Nigeria. The sample for the study consisted of 124 pre-service teachers of Basic Science from the three selected Colleges of Education in Southwest, Nigeria through multistage sampling procedure. Pre-service Teachers' Achievement Test in Basic Science (PTATBS) was used for data collection and divided into two sections A and B. Section A sought for the socio-demographic characteristics of the respondents while Section B consisted of thirty multiple-choice objective test items drawn from the topics taught.

The face and content validity of PTATBS was ensured by experts of Basic Science. Their suggestions, corrections and opinions helped in effecting the necessary modifications. The method of split-half was used to establish the reliability coefficient 0.81 for PTATBS as administered on 40 pre-service teachers outside the sampled area. The experimental procedure was in three phases namely pre-treatment, treatment and post-treatment phases. Inferential statistics of two-way Analysis of Variance (ANOVA) was used to test the formulated hypotheses at 0.05 level of significance.

Results

Hypothesis 1: There is no significant interactive effect of gender and teaching strategies (Reflective Teaching and Conventional Teaching) on the performance of pre-service teachers in Basic Science. In testing the hypothesis, post-test mean scores of pre-service teachers exposed to Reflective Teaching and Conventional Teaching were computed and compared for statistical significance using Analysis of Variance (ANOVA) at 0.05 level based on gender. The result is presented in Table 1.

Table 1: 2X2 ANOVA of Performance of Pre-service Teachers Exposed to Reflective Teaching (RT) and Conventional Teaching (CT) in Basic Science by Gender.

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Source	SS	Df	MS	F	p
Corrected Model	1388.129	3	462.710	78.923	.000
Gender	.015	1	.015	.003	.960
Group	1239.554	1	1239.554	211.427	.000
Gender * Group	2.443	1	2.443	.417	.521
Error	422.121	72	5.863		
Total	34533.000	76			
Corrected Total	1810.250	75			

p>0.05

Table 1 reveals that the computed F-value (0.417) obtained for the groups with a p value > 0.05 was not significant at 0.05 level. The null hypothesis is not rejected. This implies that there is no significant interactive effect of gender and teaching strategies (Reflective Teaching and Conventional Teaching) on the performance of pre-service teachers in Basic Science. Similarly, the effect of gender on the posttest mean scores of pre-service teachers in Basic Science is not significant at 0.05 level ($F_{1,72}$=0.003, p>0.05). However, treatment had significant effect on the posttest mean scores of pre-service teachers in Basic Science ($F_{1,72}$=211.427, p<0.05

Hypothesis 2: There is no significant interactive effect of gender and teaching strategies (Peer Tutoring and Conventional Teaching) on the performance of pre-service teachers in Basic Science.

In testing the hypothesis, posttest mean scores of pre-service teachers exposed to Peer Tutoring and Conventional Teaching were computed and compared for statistical significance using Analysis of Variance (ANOVA) based on gender. The result is presented in table 2.

Table 2: 2 X 2 ANOVA of Performance of Pre-service Teachers Exposed to Peer Tutoring (PT) and Conventional Teaching (CT) in Basic Science by Gender.

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Source	SS	df	MS	F	P
Corrected Model	1958.432	3	652.811	113.892	.000
Gender	3.125	1	3.125	.545	.462
Group	1819.528	1	1819.528	317.441	.000
Gender * Group	.006	1	.006	.001	.974
Error	487.208	85	5.732		
Total	45039.000	89			
Corrected Total	2445.640	88			

p>0.05

Table 2 reveals that the computed F-value (0.001) obtained for the groups with a p value > 0.05 was not significant at 0.05 level. The null hypothesis is not rejected. This implies that there is no significant interactive effect of gender and teaching strategies (Peer Tutoring and Conventional Teaching) on the performance of pre-service teachers in Basic Science. Similarly, the effect of gender on the posttest mean scores of pre-service teachers in Basic Science is not significant at 0.05 level ($F_{1,85}$=0.545, p>0.05). However, treatment had significant effect on the posttest mean scores of pre-service teachers in Basic Science ($F_{1,85}$=317.441, p<0.05).

Discussion

The findings of the study showed that there was no significant interactive effect of gender on performance of pre-service teachers exposed to Reflective Teaching, Peer-Tutoring and Conventional teaching strategies in Basic Science. The findings agree with the submission of Ezenwosu and Nworgu (2009) that students' gender has no influence on academic achievement of pre-service teachers in biology. However, the study contradicts Alio and Harbor-Peters (2000) who found gender disparity in performance of pre-service teachers in Basic Science. The findings of this study showed that pre-service teachers' gender has no barrier to their academic performance in Basic Science, but the strategies used by their lecturers to teach them. It therefore implies that effective use of the two strategies (Reflective Teaching and Peer–Tutoring) would enhance better performance of pre-service teachers in Basic Science irrespective of their gender.

Conclusion and Recommendation

It was concluded that the performance of the pre-service teachers exposed to Reflective Teaching, Peer Tutoring and Conventional Teaching was not influenced by their gender. The use of Reflective Teaching and Peer Tutoring instructional strategies should be encouraged in teaching pre-service teachers of Basic Science in Colleges of Education to enhance their professional skills since the

strategies are not gender biased.

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Practice of Exclusive Breastfeeding Among Nursing Mothers in Odo Ado Community Ado Local Government, Ekiti State

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Abstract:

This study assessed the practice of exclusive breastfeeding among nursing mothers in Odo Ado Community Ado local government, Ekiti State. The study specifically assessed the level of knowledge of exclusive breastfeeding; determined the perception of exclusive breastfeeding; investigated the practice of exclusive breastfeeding; and examined the factors hindering the practice of exclusive breastfeeding among nursing mothers in Odo Ado Community, Ado Local government, Ekiti state. Descriptive of the cross-sectional type research design was used in this study. The target population for the research was the nursing mothers in Odo Ado community, Ado Local Government, Ekiti State. Snowball sampling technique was used in selecting participant until data saturation of 100 (hundred) nursing mothers in Odo Ado community. A Self- structured questionnaire was the instrument used for the study. The questionnaire comprised of five sections: section A, B, C, D and E**.** The instrument was subjected to face and content validity. Internal consistency method was used to determine the reliability of the instrument. The data collected were subjected to Cronbach Alpha which yielded reliability co-efficient value of 0.82. Data collected were subjected to descriptive statistics. The findings of the study revealed that majority of mothers (54%) practice exclusive breastfeeding while (46%) does not practice it. It was recommended among others that exclusive breastfeeding for six months of life should be encouraged among mothers irrespective of the nature of work or level of education.

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Introduction

Breastfeeding is a natural and critical act that provides optimally, the energy and nutrients required to satisfy all the needs of the child during the first half of infancy and subsequently providing, up to half or more and one third of the child's nutritional and energy needs during the second half of infancy and the second year of life respectively, (World Health Organization, 2018) Exclusive breastfeeding is a public health intervention and one of the most significant strategies for improving infant survival rates (Agunbiade &Ogunleye, 2020). In order to achieve optimal growth and overall wellbeing of the child, (WHO, 2018) as a consequence of evidenced based findings, has recommended that, infants within one hour of life should be initiated and exclusively breastfed for six months after which, complementary foods should be introduced as breastfeeding continues for up to two or more years.

There are increased concerns globally and regionally about the low and in some cases, declining rates of breastfeeding. In Geneva 2016, WHO advocated that, countries need to stop the inappropriate marketing of breast milk substitutes and at the same time, emphasize and promote breastfeeding as a human right, with the intention of protecting and supporting both mother and child. Notwithstanding, there appears to be a current increase in the number of infants 0 - 6 months being exclusively breastfed globally (46%) when compared with the period from 2007 to 2014, where only about 36% was reported to be exclusively breastfed (WHO, 2018).

However, while Eastern and Southern Africa had the highest rates of exclusive breastfeeding, West and Central Africa had the lowest rates with Nigeria having one of the lowest and declining rates in the African continent from 28% in 1999 to 17% in 2013. This is in spite of the fact that, almost all children in Nigeria (98%) have been breastfed at some time or the other (National Population Commission (NPC), 2019; United Nations Children's Fund, 2019).

According to Global breastfeeding scorecards, (2018), only 41% of infants are exclusive breastfed globally in the first six months of life which is still far from the 2030 global target of 70%, Two-thirds of mothers continue breastfeeding till one year of age and by two years, the rate drops further to 45%. In Nigeria although the initiation of breastfeeding has improved, the practice and duration of exclusive breastfeeding remains low. (NPC, 2019), According to the 2018 Nigeria Demographic and Health Survey, 42% of children commence breastfeeding in the first hour of life with only 29% of children exclusively breastfed in the first six months of life.

The initiation and practice of breastfeeding is influenced by several factors such as parity, maternal level of education and age, place of delivery, family support structure and the prevailing cultural values (Ukegbu, et al, 2018). Also Osibogun, et al (2018), identified breastfeeding as not being satisfying to babies, cultural beliefs, poor spousal, family and work place support, need to return to work, maternal health problems and need for a baby to learn to eat other foods as leading barriers to exclusive breastfeeding among the mothers.

Breastfeeding is of immense benefit to both mother and child with the potential of preventing about 0.8 and 0.02 million annual deaths in children less than 5 years and from breast cancer respectively. While breast milk enhances neurological development and protects the child from diseases like diarrhea, pneumonia and malnutrition, breastfeeding promotes the health of the mother by improving child birth spacing and reducing the risk of diseases such type 2 diabetes, ovarian and breast cancer; and it also plays an important role in increasing the household income and improving food security (Victoria, et al., 2016). More so, early initiation and practice of exclusive breastfeeding has been reported to reduce neonatal mortality by up to 22% and infant mortality by 13% respectively (Jones, et al., 2017).

According to Vennemann, (2018), Respondents within the ages of 25 – 32 constituted 40.6 %, and those between the ages of 19 – 24 were 30.4%, 33 – 39 represented 22.5% and 40 and above respondents representing 6.5%. Research carried out by Agho, et al (2018) in Ekiti State on practice of exclusive breastfeeding shows that the socio-economic status of mothers has also been found to influence the decision of mothers' to exclusively breastfeed. Also found that mothers from socio-economically privileged groups were more likely to exclusively breastfeed than their counterparts in the lower socioeconomic status. Adewale, et al (2019) further suggest that effective breastfeeding practice is low among the study participants in Ekiti state particularly among the less educated, the perception of mothers towards exclusive breastfeeding is discouraging as most mothers give different reasons for not breastfeeding their babies, thus this study assessed the practice of exclusive breastfeeding among nursing mothers in Odo Ado Community Ado local government, Ekiti State. The study specifically:

1. assessed the level of knowledge among nursing mothers in Odo Ado Community, Ado Local government, Ekiti State towards exclusive breastfeeding;
2. determined the perception of nursing mothers in Odo Ado Community, Ado Local government, Ekiti State on exclusive breastfeeding;
3. investigated the practice of exclusive breastfeeding among nursing mothers in Odo Ado Community, Ado Local government, Ekiti state; and
4. examined the factors hindering the practice of exclusive breastfeeding among nursing mothers in Odo Ado Community, Ado Local government, Ekiti state.

Methodology

Descriptive of the cross-sectional type research design was used in this study. The target population for the research was the nursing mothers in Odo Ado community, Ado Local Government, Ekiti State. Purposive sampling technique was used in selection Odo Ado, community because of the rural peculiarity of the setting. Snowball sampling technique was used in selecting participant until data saturation of 100 (hundred) nursing mothers in Odo Ado community, Ado local government, Ado Ekiti. A Self- structured questionnaire was the instrument used for the study. The questionnaire comprised of five sections: section A, B, C, D and E**.** Section A focused on the socio-demographic characteristic of the respondents, Section B assessed level of knowledge about exclusive breastfeeding, Section C assessed the perception of nursing mothers on exclusive breastfeeding, Section D assessed the practice of exclusive breastfeeding, while Section E assessed the factors hindering the practice of exclusive breastfeeding. The instrument was subjected to face and content validity. Internal consistency method was used to determine the reliability of the instrument. A pilot study was carried out using the nursing mothers in Oke Isa community Ado Ekiti, to determine the consistency of the questionnaire. The data collected were subjected to Cronbach Alpha which yielded reliability co-efficient value of 0.82. Data collected were subjected to descriptive statistics.

Results

Table 1: Socio-demographic Data of Respondents

Variables	Frequency	Percentage (%)
Age		
19-24years	38	38.0
25-32years	39	39.0
33-39years	23	23.0
40years and Above	0	0.0
Total	100	100

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Marital Status		
Single	33	33.0
Married	67	67.0
Divorced	0	0.0
Total	100	100.0
Level of Education		
Not educated	24	24.0
Primary	16	16.0
Secondary	30	30.0
Tertiary	30	30.0
Total	100	100.0
Occupation		
Civil Servant	21	21.0
Trader	29	29.0
Self employed	26	26.0
unemployed	24	24.0
Total	100	100.0
Religion		
Christianity	48	43.0
Islam	44	44.0
Tradition	8	8.0
Total	100	100.0
Number of Children		
1-2	35	35.0
3-4	60	60.0
5-6	5	5.0
Above 7	0	0
Total	100	100

Table 1 shows the demographic data of the respondents as 39% of the respondents were between the ages of 25-32years, 38% were between the ages of 19-24years, 23% were between the ages of 33-39years, while none of the respondents was 40years and above. On marital status, 67% of the respondents were married, 33% were single, while none were divorced. On level of education, 30% of the respondents had secondary education, 30% had tertiary education, 24% were not educated, while 16% had primary education. On occupation status, 29% of the respondents were Traders, 26% were self-employed, 24% were unemployed, while 21% were civil servants. On religion, 48% of the respondents were Christians, 44% were of Islamic religion, while 8% were traditional worshippers. On number of children, 60% of the respondents had the number of children between the ranges of 3-4, 35% between the ranges 1-2, while 5% between the ranges of 5-6.

Table 2: Knowledge of Nursing Mothers on exclusive breastfeeding

S/N	Variables	Frequency	Percentage (%)

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1.	**If answer to question 7 is yes where?**		
	Hospitals	34	59.0
	Church	11	19.0
	Mosque	3	5.0
	Friends	10	17.0
	Total	**58**	**100.0**
2.	**What do you understand by Exclusive Breastfeeding?**	65	35.0
	Feeding a child with breast milk and water for 6 months	1	1.0
	Feeding a child with breast milk only to 3months	35	63.0
	Feeding a child with breast milk for 6 months	1	1.0
	Feeding a child with breast milk and infant formula for 6months		
	Total	**100**	**100.0**
3.	**When should breastfeeding be initiated?**		
	Immediately after delivery	55	55.0
	Some hours after delivery	21	21.0
	Some days after delivery	24	24.0
	Never breast feed	0	0
	Total	**100**	**100.0**
4.	**What do you do with the first milk or colostrum?**		
	Discard	42	42.0
	Feed immediately	58	58.0
	Total	**100**	**100.0**
5.	**When is the right time to start complementary foods?**	15	15.0
	4 months	30	30.0
	5 months	25	25.0
	6months	20	20.0
	7 months and above		
	Total	**100**	**100.0**
6.	**What are the benefits of Exclusive Breastfeeding?**		
	Child growth and development and builds the child immunity	92	92
	Protects the child from diarrhoea and kill the child	4	4
	Respiratory diseases and destroy the child's brain	2	2
	Improves the child response to vaccination and cause growth retardation	2	2
	Total	**100**	**100**
7.	**Should a child be given food or water by 4 months?**	26	26.0
	Yes	49	49.0
	No	25	25.0
	I don't know	**100**	**100.0**
	Total		

Table 2 illustrates the Knowledge of Nursing Mothers in Odo community, Ado Local Government towards Exclusive Breastfeeding. Of 58% of the respondents that claimed to have heard of Exclusive Breastfeeding,

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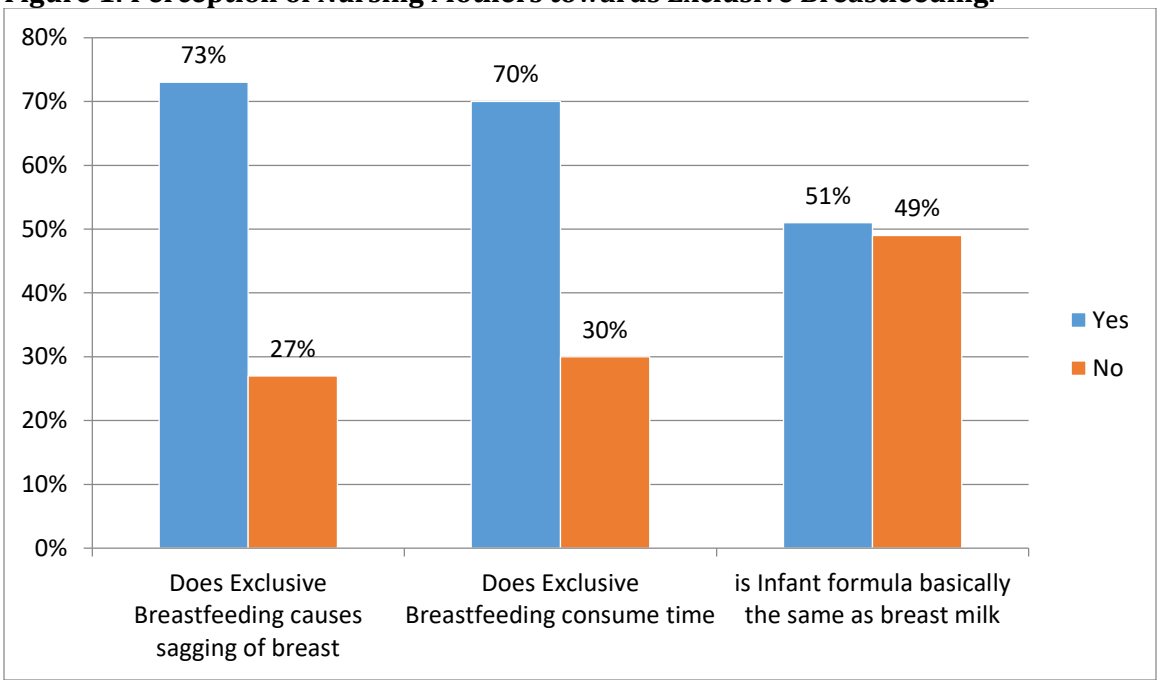
34% of the respondents indicated that they heard of Exclusive Breastfeeding in the Hospital, 11% indicated that heard of exclusive breastfeeding from the church, 11% their friends, while 3% heard of it in the mosque. About 65 % of the respondents understood exclusive breastfeeding as the feeding of a child with breast milk and water for 6months 35% understood exclusive breastfeeding as the feeding of a child with breast milk alone for 6months, 1% understood it as the feeding of a child with breast milk only to 3 months, while 1% understood it as the feeding of a child with breast milk and infant formula for 6months. Around 55% of the respondents responded that breastfeeding should be initiated immediately after delivery, 24% indicated that it should be initiated some days after delivery, while 21% indicated that it should be started some hours after delivery.

About 58% of the respondents indicated that they fed the colostrums immediately, while 42% discarded the first milk or colostrums. 35% of the respondents indicated that 6 months is the right time to start complementary foods, 30% indicated that 5months as the right time, 20% indicated 7months or above, while 15% indicated 4months. 50% of the respondents indicated that the benefit of Exclusive Breastfeeding is child growth and development and builds the child immunity, 30% indicated that it protects the child from diarrhea and kill the child, 10% indicated that it causes respiratory diseases and destroy the child brain, while 10% indicated that it improves the child response to vaccination and cause growth retardation. 45% of the respondents responded that a child should not be given food or water by 4months old, while 30% responded that a child should be given food or water by 4months, while 25% do not know.

Figure 1: Perception of Nursing Mothers towards Exclusive Breastfeeding.



The figure above shows the perception of the respondents towards Exclusive Breastfeeding. 73% of the respondents indicated that Exclusive Breastfeeding causes sagging of breast, 70% of the respondents indicated that Exclusive breastfeeding consumes time, while 51% of the respondents indicated that infant formulae basically is the same as breast milk and 41% indicated that infant formulae is basically not the same as breast milk.

Table 3: Practice of Exclusive Breastfeeding among Nursing Mothers in Odo Ado Community, Ado local government, Ekiti State

S/N	VARIABLES	FREQUENCY	PERCENTAGE(%)
1.	**Have you ever practice Exclusive Breastfeeding**		

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	before? Yes No Total	54 46 100	54.0 46.0 100
2.	**If answer to question 1 is yes, for how long?** 6months <6months >6months Total	 24 20 10 54	 44.4 37 18.6 100
3.	**Did you practice it on all your children?** Yes No Total	 54 46 100	 54.0 46.0 100.0
4.	**How many times do you breastfeed your baby in a day?** 0-3times 5-8times On demand Total	 23 35 42 100	 23.0 35.0 42.0 100.0
5.	**When did you introduce bottle feeding to your child?** 4months 6months <6months >6months Total	 28 31 15 25 100	 28.0 31.0 15.0 25.0 100.0
6.	**What are the reasons for breastfeeding?** Baby's wellbeing Bonding To save money Cultural belief Total	 39 37 13 11 100	 39.0 37.0 13.0 11.0 100.0

Table 3 above represents the response of the respondents on the practice of Exclusive Breastfeeding. About 54% of the respondents indicated that they had practiced Exclusive Breastfeeding before, 46% haven't practice it before. Of the 54% that claimed to had practiced Exclusive Breastfeeding, 44.4% practiced it for 6months, 37% practiced it for less 6 months, while 18.6% practiced it more than 6months.

Around 54% of the respondents indicated that they practiced Excusive Breastfeeding on all their children, while 46% indicated that they didn't practice it on all their children. 42% of the respondents breastfed their babies on demand in a day, 35% breastfed their babies between the ranges 5-8times, while 23% breastfed between the ranges 0-3times in a day.31% introduced bottle feeding to their children at 6months, 28% introduced it at 4months, 25% introduced it more than 6months, while 15% introduced it less than 6months. 39% of the respondents responded that the reason for breastfeeding was for the baby's wellbeing, 37% responded that it was for bonding, 13% responded that it was to save money, while 11% responded that it was for cultural belief.

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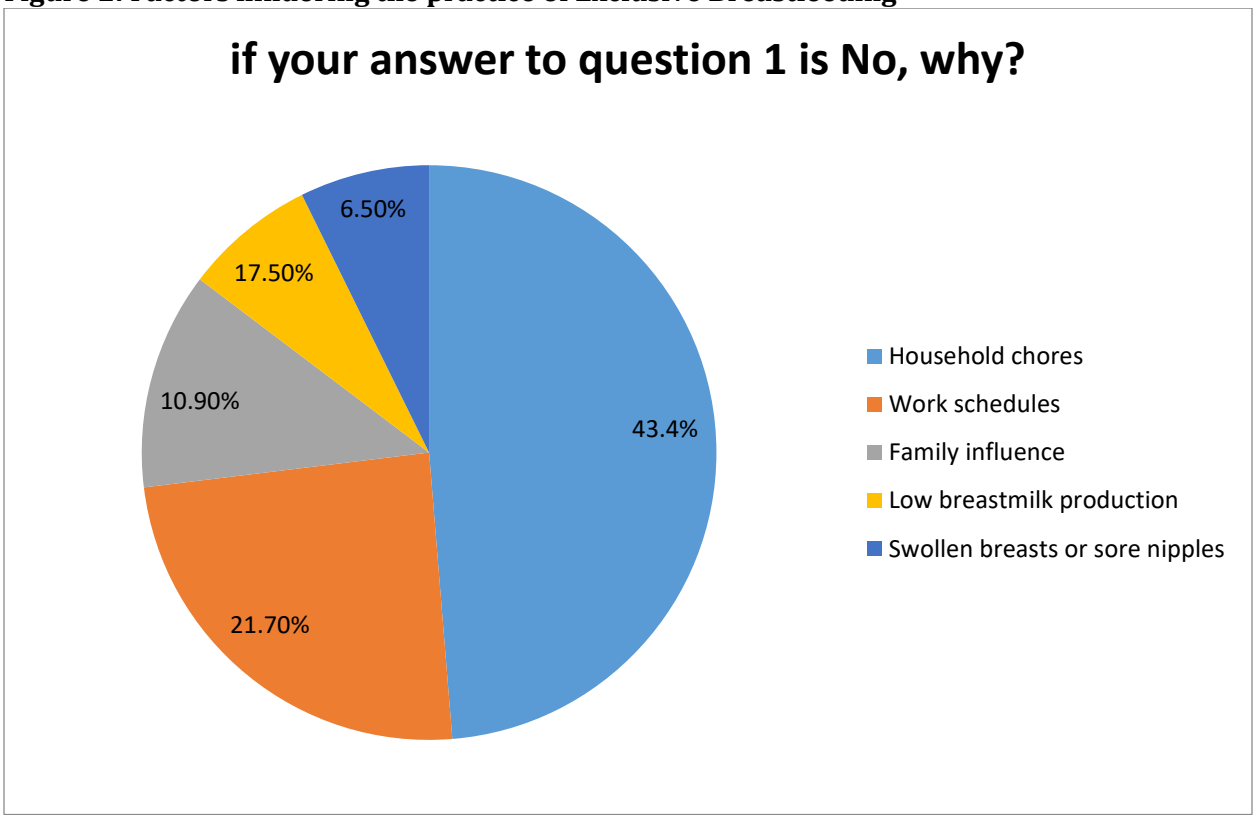
Figure 2: Factors hindering the practice of Exclusive Breastfeeding



The figure above shows the response of the respondents that indicated that they had never practiced Exclusive Breastfeeding and the reasons for not practicing Exclusive Breastfeeding. Majority (43.3%) of the respondents responded that it was due to house chores, 21.7% mentioned work schedules as the reason for not practicing Exclusive Breastfeeding, 17.50% mentioned that it was due to low breast milk production, 10.90% indicated that it was due to family influence, while 6.50% mentioned that it was due to swollen breasts or sore nipples.

Table 4: Factors influencing the practice of Exclusive Breastfeeding

S/N	Variables	Frequency	Percentage
1.	**What are the factors influencing you from practising exclusive breastfeeding?**		
	Tight Job Schedule	39	39
	It is time consuming	42	42
	Short duration of maternity leave	19	19
	Total	100	100
2.	**Who influenced your breastfeeding decision?**		
	Mother-in-law	28	28.0
	Friends	20	20.0
	Partner	12	12.0
	Doctors/midwife/Nurse	40	40.0
	Total	100	100.0
3.	**What is the reason for the late initiation of breastfeeding?**	34	34.0
	Colostrum is dirty	26	26.0
	No breast milk	7	7.0

	Mother sickness Child sickness No reasons Total	5 28 100	5.0 28.0 100.0

Table 4 represents the factors influencing the practice of Exclusive Breastfeeding. 42% of the respondents indicated Exclusive Breastfeeding is time consuming, 39% indicated that tight job schedule hindered them from practicing Exclusive Breastfeeding, while 19% indicted that the short duration of maternity leave hindered them from practicing Exclusive Breastfeeding. 40% of the respondents indicated Doctors/midwife/Nurse influenced their breastfeeding decision, 28% indicated that their mother-in-law influenced their breast feeding decision, 20% indicated that their friends influence their breastfeeding decision, while 12% indicated that their partner influenced their Breastfeeding decision. Majority (34%) of the respondents responded that their reason for late initiation of breastfeeding was because the colostrum was dirty, 28% indicated that there was no reason, 26% responded that it was because of No breast milk, 7% indicated that the mother's sickness made them to initiate breastfeeding late, while 5% indicated that the child's sickness made them to initiate breastfeeding late.

Discussion of Findings

Result from table 1 revealed that 55% of the respondents responded that breastfeeding should be initiated immediately after delivery, 24% indicated that it should be initiated some days after delivery, while 21% indicated that it should be started some hours after delivery. 58% of the respondents indicated that they fed the colostrum immediately, while 42% discarded the first milk or colostrum. 45% of the respondents responded that a child should not be given food or water by 4months old, while 30% responded that a child should be given food or water by 4months, while 25% do not know. This corroborate with the study carried out by Illyasu et. al (2020) and Victoria, et. al (2016), which agrees with the respondent response that 55% of the initiate breastfeeding immediately after delivery, 21% some hours after delivery, while 24% initiated breastfeeding some days after delivery. Also, 60% of the respondent feed their babies with colostrum immediately, while 40% discard colostrum after birth. 45% of the respondents responded that a child should not be given food or water by 4months old, while 30% responded that a child should be given food or water by 4months, while 25% do not know.

The figure 1 represents the response of participant on their perception towards Exclusive Breastfeeding. 73% of the respondents indicated that Exclusive Breastfeeding causes sagging of breast, 70% said it consumes time, while 51% indicated that infant formulae are basically the same as breast milk and 41% indicated that infant formulae are basically not the same as breast milk. This agrees with repot of the National Health Survey (2016) on perception of mothers on exclusive breastfeeding practices. Most of the mothers (67%) are of the perception that EBF will make their breast sag. 33% are of the perception that infant formula is basically the same as breast milk.

Table 3 represents the response of the respondents on the practice of Exclusive Breastfeeding. About 54% of the respondent practice Exclusive Breastfeeding, 46% haven't practice it before.44% practiced it for 6months, 37% practiced it for less 6 months, while 18.6% practiced it more than 6months. This agrees with the study conducted by Essien, et al (2018); and WHO (2019), revealed that the majority of the respondents (60%) practice exclusive breastfeeding while 40% did not practice it. WHO, (2019) also revealed that 54.4% of the respondent practiced it for 6months, 27% practiced it for less 6 months, while 18.6% practiced it more than 6months. 39% of the respondents state the reason for breastfeeding as baby's wellbeing, 37% responded revealed bonding, 13% responded that it was to save money, while 11% responded that it was for cultural belief. This disagrees with the study carried out by Akpor, et al (2017) which revealed that about 46.3% of the participants breastfed their babies so as to ensure the child's wellbeing and 36.8% also signify bonding/closeness to baby has their reason. Only 10.5% and 6.3% of the participants mentioned money and family/cultural beliefs respectively as their main reasons for breastfeeding.

Table 4 represents the factors influencing the practice of Exclusive Breastfeeding. 40% of the respondents

indicated Doctors/midwife/Nurse influenced their breastfeeding decision, 28% indicate their mother-in-law, 20% indicate their friends, while 12% indicate their partner. This agrees with the research carried out by Department of Nursing, College of Medicine and Health Sciences, Afe Babalola University (2018), which state that 49.5% of the participants indicated that their doctors and midwives, 48.8% them indicate their mother- in-law while 32.6% of them indicate their friends. 34% of the respondents responded that their reason for late initiation of breastfeeding was because the colostrum was dirty, 28% no reason, 26% No breast milk, 7% mother's sickness made them to initiate breastfeeding late, while 5% indicate child's sickness. This finding agrees with Onayande et al (2018) in Ile-Ife who state that the major reason for late initiation of breastfeeding in most (47%) of the respondents was colostrum not pure thus supporting the general perception in the study area that in the first three days, the mother's milk is not pure and therefore could harm the infant.

Conclusion

Majority of mothers (54%) practice exclusive breastfeeding while (46%) does not practice it. However, mortality and morbidity rate is low in infants fed with breast milk exclusively for the first six months of life, thus there is need to health educate mothers on exclusive breastfeeding. Midwives should lay emphasis on health educating mothers about Exclusive breastfeeding, how to carry it out and allow for return demonstration. Also health educates them on proper attachment, and positioning of the baby to breast, and the duration of exclusive breastfeeding, this will improve their knowledge about excusive breast feeding.

Recommendations

Considering the result of the findings, the following suggestions are recommended.

1. Exclusive breastfeeding for six months of life should be encouraged among mothers irrespective of the nature of work or level of education.
2. Seminars and workshop in prevention of non-compliance of exclusive breastfeeding should be done especially at the community level, thus will encourage exclusive breastfeeding.
3. Mothers should be encouraged to feed their baby on demand through health education.
4. There should be more awareness on the practice of exclusive breast feeding over the radio, television, newspaper, posters and enlighten the public through the ministry of health, federal and state government.
5. Using visual aids to demonstrate to the mothers on how healthy their babies could be if exclusive breastfeeding is done.
6. Government should organize baby shows and giving prizes to healthy babies who are breast fed.
7. Government should construct crèche in working places to encourage working class mothers on exclusive breastfeeding.
8. Mothers should be enlightened through health education and public enlightenment that they should not look at the aesthetic purpose
9. Institution should adhere to the 4-6 moths given to mothers for post-natal maternal leave, so that nursing mothers can stay at home and breast feed their babies.
10. Further research on practice of exclusive breastfeeding among working class nursing mothers.

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Interactive Effect of Gender, Mode of Schooling and Orientation Instructional Strategy On Secondary School Students' Performance in Biology in Ekiti State

Author(s), AMIRE, Ayowumi Olubukola (Ph.D.)

Abstract:

The study examined interactive effect of gender, mode of schooling and orientation instructional strategy on secondary school students' performance in biology in Ekiti State. The study adopted pre-test, post-test quasi-experimental design. The population of the study consisted of all SS2 students offering Biology in Ekiti state. The sample comprised 200 students offering Biology and was selected through multi-stage sampling procedure. Biology Achievement Test (BAT) was used for data collection. It consisted of two sections A and B. The validity of the instrument was ascertained by experienced Biology teacher and experts in Tests and Measurement. The reliability coefficient of 0.83 was obtained for BAT using split-half alpha reliability. The research procedure was in three stages: the pre-treatment stage, the treatment stage and the post-treatment stage. The data collected were analyzed using inferential statistics. The hypotheses were tested using Analysis of Covariance (ANCOVA) statistics at 0.05 level of significance. The findings of the study revealed that the use of orientation before and after the teaching of Biology is a good strategy to enhance students' achievement in Biology. However, male students performed significantly higher than their female counterparts in Biology after orientation while day schools' students exposed to orientation achieved significantly higher than boarding schools' students in Biology. It was recommended that orientation instructional strategy in public school settings should be broadly conceived and involve a coordinated team approach in order to meet the needs of a diverse population of students irrespective of their gender and mode of schooling.

Keywords: Biology, Gender, Mode of Schooling, Orientation Instructional Strategy, Performance,

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Introduction

From discovering cures for diseases, to creating innovative technologies, to teaching us to think critically, science has become an indispensable feature of modern society. Therefore, in the world of today, science has become a dominant cultural factor (Abubakar, et al., 2012). Biology is the science of life. The science of biology is rapidly expanding and it has permeated most aspects of our economic/public life. Biology occupies a central position in the science world and it is the gateway to professions like; medicine, pharmacy, dentistry, nursing, sanitary inspection, agriculture and a host of others. In spite of the obvious importance and the fact that biology is an interesting subject that relates to human life, it is still a puzzle why the performance of secondary school students remains poor in the subject. Most parents, educators and professionals have expressed their deep concern over this existing problem. It has now become necessary therefore to consider that every individual is unique and differences exist among students with respect to readiness for reception of knowledge, readability and the rate of absorption of materials which may depend on the gender and possibly, the mode of schooling (boarding or day) among many factors that can be considered. Although there have been many reasons and explanations given for this situation and even many recommendations proposed, little has been achieved in bringing about the much desired and much needed effective learning of Biology by the Senior Secondary School students.

The research of Geary (2008) showed that male and female students actually learn differently. Keeping male and female in the same classroom does not make female to excel as they ought to. The reason behind this may be that male simply volunteer to answer questions which may be related to female competition value nature. Anderson (2004) posited in the group which he has studied and found that the brain of the female and male sometimes respond differently to the same experience, apparently through the action of sex hormones. Sex hormones can also contribute to sex differences and achievement in the type of environment factor and the type of experience within those factors that male and female seek.

Amold (2006) said sex hormones and perhaps more direct genetic influence can influence the way in which the brain respond to environmental input and the type of environmental input an individual seeks. In another way, it cannot be assumed that the different experience of boys and girls, men and women are driven only by cultural factors (e.g. sex role), even with the same experience it cannot be assumed that cognitive and brain development of boys and girls will be the same. In fact, biologically there is sex difference in responsiveness (in term of cognitive and brain development).

Lubinski (2004) noted that gender difference in vocational interest is especially striking among gifted youth. He concluded that for every gifted woman in her twenties, who is working towards or who aspires to earn an advance degree in Mathematics, Engineering or the Physical Sciences, there are eight equally talented men.

In modern society, this gender difference appears to contribute to the sex difference in the relative attractiveness of Mathematical-intensive careers. More generally, it appears that gifted girls are more interested in careers that involve living things such as Biology and Medicine as opposed to inorganic things as Physics and Engineering whereas gifted men show the opposite pattern on average.

This gender difference could appear to be the continuation of an object versus people orientation that emerges in infancy and is evident in the play patterns and social motives of men and women (Geary, 2008). He further argued and presented evidence to support this argument that most of these gender differences have evolved by means of sexual selection and are reflection of the

different reproductive strategies of women and men. No doubt, the different issues affecting the education of the women can be readily evidenced in the interest of girls in Biology.

Popoola (2002) was of the opinion that Science, Technology and Mathematics are masculine (while girls are very good in English spellings, writing and Arts) and thus male students' performance in the subject like Mathematics tends to be better than that of their female counterparts. According to Ogunboyede (2000), fewer members of the girls applied to study course related to science than the boys. Though, over years, girls' enrolment in schools at all levels has gradually risen yet they still comparably lag behind their male counterparts.

Several reasons have been advanced; distraction by and towards boys, which leads to lack of concentration, the desire by the girls to attract attention to them (seduction), the tendency for girls to be taken care of by the boys and to exhibit their weakness, the tendency to "give up" in the face of difficulties and so on. This shows that somehow, co-educational school system has not solved the problems it was to solve and that rather than foster intellectual growth of girls, it becomes an obstacle to their development. It could be concluded that girls show very little interest in Science and science related courses, a situation which account for their tendency to rather opt for the literary discipline such as techniques of sewing, embroidery and secretariat work.

Furthermore, researches have equally indicated that gender influences student's academic achievement. For example, Kolawole (2007) investigated on the effects of cooperative and competitive learning on academic performance of students. The result, among other things, revealed that boys performed significantly better than girls in both learning strategies. Ogunboyede (2000) opined that women have always perform excellently well in the position they found themselves. This is due to their watchword of honesty, transparency, accountability in handling both human and material resources. But the fact is that the percentage of these women that have been privileged in these science courses are still very small compared to the number of them in our society and schools. Oloyede (2004) also found that boys perform better in numerical ability and problems solving than girls.

Frempong and Ayia (2006) observed that female students are less successful in learning Biology, due to their low interest and confidence in learning Biology and their low academic expectation. According to them, girls initially have more positive attitudes towards Biology than boys do, but as they continue in school, girls' attitudes become more negative. Falebita (2007) while analyzing students' performance in WASCE and NECO found no significant difference in the performance of male and female students especially for those from single-sex schools. The study investigated whether the gender (male or female) or mode of schooling (day or boarding) of students will have effect on their achievement in Biology when exposed to orientation.

Orientation gives better information that enhances students' energy and drives to learn effectively and achieve to their potential at school. Taiwo (2012) defined orientation as an information which enables an individual to know himself/herself as a separate being, where one is in space, where one wants to move into in space, and how to get to that place. The seemingly lack of interest and commitment to learning of biology can then be attributed to lack of proper orientation. No one has ever achieved anything without a dream attached to a burning desire (Maps, 2003). Learners must be taught how to learn because learning how to learn frees one's dependency on others for knowledge. This supports a popular adage that; "give a person an idea and you enrich his life; teach a person how to learn and he can enrich his own life" (Webb, 2006).

The findings so far cannot allow generalization on gender and academic achievement. There is still need to research more; to consider divers variables like mode of schooling (day/boarding school)

and the subject concerned among others. The study examined interactive effect of gender, mode of schooling and orientation instructional strategy on secondary school students' performance in biology in Ekiti State.

Research Hypotheses

The following null hypotheses were generated from research questions.

1. There is no significant difference between the achievement of male and female students in Biology before and after orientation.
2. There is no significant difference between the achievement of day and boarding students in Biology before and after orientation.

Research Method

The study adopted pre-test, post-test quasi-experimental design. The population of the study consisted of all SS2 students offering Biology in Ekiti state. The sample comprised 200 students offering Biology and was selected through multi-stage sampling procedure. Stage one involved the selection of five Local Government Areas across the three Senatorial Districts in Ekiti State through stratified random sampling technique. The second stage involved the selection of five schools from the selected Local Government Areas through purposive random sampling technique because the type of school in respect of gender and mode of schooling (day/boarding) were considered. . The third stage involved the selection of 40 Biology students from each of the five selected schools using purposive random sampling techniques. The last stage involved the selection of 20 male and 20 female students using stratified simple random sampling technique.

Biology Achievement Test (BAT) was used for data collection. It consisted of two sections A and B. Section A consists of student's bio-data while section B contains 20 objective questions drawn from the scheme of work for Senior Secondary School two to measure achievement in Biology. Each question has four options from which the students are required to choose the correct answer. The validity of the instrument was ascertained by experienced Biology teacher and experts in Tests and Measurement. The reliability coefficient of 0.83 was obtained for BAT using split-half alpha reliability. The research procedure was in three stages: the pre-treatment stage, the treatment stage and the post-treatment stage.

The data collected were analyzed using inferential statistics. The hypotheses were tested using Analysis of Covariance (ANCOVA) statistics at 0.05 level of significance.

Results

Hypothesis 1: There is no significant difference between the achievement of male and female students in biology before and after orientation.

Table 1: ANCOVA of the difference between Biology achievement of male and female students before and after orientation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8945.280[a]	4	194.463	11.219	.034
Covariate	5172.936	1	5172.936	298.554	.000
Group	3348.862	2	176.256	10.169	.040
Gender	2470.832	1	123.542	7.127	.045
Gender * Group	786.825	2	196.706	11.348	.037
Error	52.000	40	17.333		
Total	22,852.000	45			
Corrected Total	8997.280	44			

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a R Squared = .994 (Adjusted R Squared = .906)

Table 1 showed that the interactive P-value (0.034) is less than 0.05 level of significance. This means that there is a significant interactive difference for group and sex. Also, there is a significant main difference in the achievement of students between the groups (before and after orientation) as P-value (0.00) is less than 0.05 level of significance. Furthermore, there is significant main difference in the performance of male and female students as P-value (0.037) is less than 0.05 level of significance. The F-calculated (7.127) was significant because the p-value of 0.045 is less than 0.05 level of significance. Based on these findings, the null hypothesis is rejected. This means that there is a significant difference between the Biology achievement of male and female students before and after orientation.

In order to investigate the direction of the difference observed between the Biology achievement of male and female students before and after orientation, Scheffe post-hoc test was carried out.

Table 2: Post-hoc test of students' gender

Sex	Mean Difference	Alpha
Male	66.56	13.95
Female	41.78	

P>0.05 (significant)

The result in Table 2 showed that the male mean score (66.56) was higher than the female mean score (41.78). The alpha value (13.95) which shows the level of difference between male and female performance was very high. This implies that male students performed significantly higher than their female counterparts in Biology after orientation.

Hypothesis 2: There is no significant difference between the achievement of day and boarding students in Biology before and after orientation.

Table 3: ANCOVA of the difference between Biology achievement of day and boarding School students' before and after orientation

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	11746.020(a)	4	255.348	5.440	.043
Covariate	571192.851	1	571192.851	5457.257	.000
Group	6062.595	2	319.084	7.049	.025
School Type	2355.161	1	117.758	4.125	.036
School type * Group	1474.367	2	368.592	3.522	.015
Error	314.000	40	104.667		
Total	718445.000	45			
Corrected Total	12060.020	44			

a R Squared = .974 (Adjusted R Squared = .575)

Table 3 shows that the interactive P-value (0.043) is less than 0.050. This means that there is a significant interactive difference for group and school system. Also, there is significant main difference in the achievement of students between the groups (before and after orientation) as P-value (0.00) is less than 0.05 level of significance. Furthermore, there is significant main difference in the achievement of day and boarding school students as P-value (0.015) is less than 0.050. The

F-calculated (4.125) was significant because the p-value of 0.045 is less than 0.05 level of significance. Based on these findings, the null hypothesis is rejected. This means that there is a significant difference between the Biology achievement of day and boarding students before and after orientation.

In order to investigate the direction of the difference observed between the Biology achievement of day and boarding school students before and after orientation. Scheffe post-hoc test was carried out.

Table 4: Post-hoc test of Day and Boarding Students' Achievement

School System	Mean Score	Alpha
Boarding	44.11	5.33
Day	68.90	

P>0.05 (significant)

The result in Table 4 shows that the day students mean score (68.90) was greater than the boarding students mean score (44.11). The alpha value (5.33) shows the level of difference between boarding and day students' achievement as high. This implies that day schools' students exposed to orientation achieved significantly higher than boarding schools' students in Biology.

Discussion

The study further revealed significant difference in the achievement of male and female students in Biology before and after orientation. Male students performed significantly higher than their female counterparts in Biology before and after orientation. Anderson (2004) in one of his studies found that the brain of the female and male sometimes respond differently to the same experience, apparently through the action of sex hormones. It could be concluded that girls show very little interest in science and Biology-related courses, a situation which account for their tendency to rather opt for the literary discipline such as techniques of sewing, embroidery and secretariat work. A significant difference was found in the study between day and boarding school students before and after orientation. Day schools students exposed to orientation achieved significantly higher than boarding schools students in Biology. Boarding school system has lost its effectiveness due to inadequate monitoring and supervision. Students in the boarding school no longer concentrate on their studies and the aftermath is poor performance in their studies especially in science-related subjects (Ola & Egbon, 2001).

Conclusion and Recommendation

Based on the findings of this study, it was concluded that the use of orientation before and after the teaching of Biology is a good strategy to enhance students' achievement in Biology. However, male students performed significantly higher than their female counterparts in Biology after orientation while day schools' students exposed to orientation achieved significantly higher than boarding schools' students in Biology. Orientation in public school settings should be broadly conceived and involve a coordinated team approach in order to meet the needs of a diverse population of students irrespective of their gender and mode of schooling.

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An Appraisal of Housing Policies Performances in Nigeria: Associated Problems and Past Efforts of Government

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And
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Abstract:

Housing, like food and clothing, is a basic human requirement. A person's well-being, survival, and health depend on it. This study appraised housing policies performances in Nigeria, with examination of associated problems and past efforts of government. Content analysis and assessment techniques were utilized to gather and analyze credible and valid data on Nigerian housing policy concerns and housing condition outcomes in this expository research. Nigeria's housing policies and problems were analyzed using books, existing records, published works in the form of yearly reports and reviews and government documents, as well as academic articles on housing studies in general and conference papers from the field. Research found that Nigeria's policies and programs have made significant gains in the creation and supply of housing. There are a number of faults in the policies and programs despite the fact that poverty, growing construction and building material costs and homelessness, poor policy structures for housing provision, administrative backlogs in building permit and receipt of certificate of occupancy are among them. The study recommended that Nigeria's housing policy must be examined on a regular basis in order to ensure that it is functional and acceptable to the public. Other than that, in order to achieve effective housing provision, there must be accessibility to land, financing, and construction supplies. Infrastructure, housing maintenance, and incentives for insurance companies should also be provided to support affordable home development. Low-income households should be considered in the development of housing policy among others.

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Introduction

In the last three decades, the population of Nigeria, particularly in the cities, has grown phenomenally without a corresponding growth in housing units, resulting in a severe shortage of livable homes. There is a horrible atmosphere as a result of overcrowding as well as bad living circumstances, increased poverty rates and social vices, etc. In many developing nations, public housing projects fail to offer enough, affordable, and high-quality housing for the target population (Ruonavaara, 2018; Hansson, 2018). Governments in developing nations, on the other hand, are reported to be pressing ahead with efforts to solve the issue of providing suitable, affordable, and long-term housing (Eerola & Saarimaa, 2018; Clapham, 2018). According to El-Hadj, et al (2018), ensuring that everyone has access to decent housing is a shared responsibility that involves not only governments, but also the private sector, non-governmental organizations, municipalities and other regional or local authorities, as well as international organizations and NGOs.

Housing, like food and clothing, is a basic human requirement (Barker, 2019). A person's well-being, survival, and health depend on it (Mukhtar et al., 2000). A person's status in society might be determined by the quality of his or her residence. The standing of a man in society can be influenced by where he lives and the sort of house he has, shelter is essential to human existence (Wapwera et al., 2017). According to Wapwera et al. (2017), housing is defined as having the ability to have access to land, shelter, and the amenities essential to make the shelter practical, convenient, visually pleasing, safe and hygienic. A lack of proper housing can negatively impact a person's health, safety, and personal privacy. Invariably, the housing sector's performance is used as a gauge of a nation's health (Ezennia & Hoskara, 2019; Mukhtar, et al., 2016).

In both rural and urban parts of Nigeria, there is a wide range of housing issues. Rural areas have a housing shortage because of the quality of the housing stock, whereas metropolitan areas face a shortage of quantity. Qualitative shortcomings such as location, degree of goodness, and house value all play a role in rural housing challenges. As stated by Kampamba et al. (2018), rural housing is incomplete since social services are not sufficiently linked to them such as power, water, and transportation.

High urbanization, an ever-increasing number of urban dwellers, and the rising demands of Nigerians all contribute to the country's housing shortage. More specifically, Lawal and Adekunle (2018) found that the most pressing urbanization challenges are inadequate housing, unplanned construction and inefficient upkeep of existing structures, ageing, and the lack of social infrastructure. Homes in urban core regions are also characterized by a lack of suitable infrastructural facilities, such as poor ventilation, no in-built toilets or kitchens, and a poor trash disposal system. Lack of planning, the emergence of shanty settlements, and the availability of decaying dwellings are further issues related with urban housing.

There are many issues with housing in Nigeria, including poverty, discrimination against using indigenous materials, ineffectual housing financing, inadequate financial instruments for mobilizing funds, high building material costs and a lack of infrastructure facilities, as well as bureaucracies in acquiring land, processing of certificates of occupancy (C of O), and approval of construction plans. Some of the other obstacles to housing creation, upkeep, and delivery include a lack of good planning; ineffective government programs and regulations; uncontrolled private sector engagement; weak policy structures and poor research and technology into housing (Smets & van Lindert, 2016). It has been suggested that housing is linked to a wide range of problematic social and economic phenomena, including inflation, income policy, and the other difficulties (Smets & van Lindert, 2016). However, the ever-increasing demand cannot be matched by supply

as a result of all of these issues.

Literature Review

As argued by Daniel and Hunt (2014), the primary goal of urban and rural land use planning is to provide a more practical, aesthetically beautiful, and economically feasible physical environment for people to live, work, play, and move around in. The housing strategy recognized that a key issue in Nigeria is the lack of suitable housing in accordance with the town planning regulations (Aliu, et al., 2018) as both qualitative and quantitative deficits exist in urban and rural areas, hence, poor environmental quality and deterioration in human health will result (Ebekozien, 2020).

According to Eerola (2021), laws, regulations, and administrative procedures that facilitate the construction and distribution of homes constitute a housing policy. This policy was also formulated in accordance with the basic ideals of freedom, fairness, equity and authority as well as public interest. Nigeria's housing crisis is the primary focus of the policy. Like other policies, has a set of objectives and a plan for achieving them. All Nigerians should have access to safe, decent, and affordable housing as a main objective of the national housing policy. Land ownership, financing, construction, and delivery were all covered under the policy (Eerola, 2021).

For a successful housing policy to be implemented, the role of government must be considered, and this can include everything from land use planning and control to financial and credit assistance, subsidies to low-income groups, rent control and more. The government can also be involved at specific stages or when solutions are needed for specific problems, such as land use plans and controls to financial assistance and credit aids, subventions to low-income groups, and rent control (Iheme, et al., 2015)

Oyebanji, et al (2017) indicated that the strategy placed a high priority on ensuring that people had access to essential amenities such as drinkable water and transportation, as well as electricity. Decree No. 53, which came into effect in December of 1989, also established a legal foundation for the functioning of Nigeria's principal mortgage institutions. As a result, the policy permits the government, non-governmental groups, and community-based organizations to work together on housing projects. Additionally, tax breaks on home equity loans and other financial aid were made available to home builders. Housing policies encouraged using local building materials, as well. Overall, Nigeria's housing strategy has been able to address some of the country's housing issues (Oyebanji, et al., 2017).

According to Festus and Amos (2015), the government's efforts in formulating and implementing the National Housing Policy have been noteworthy so far. Many Nigerians are still living in dilapidated and squalid conditions despite the government's best attempts to improve the situation. According to recent studies (Iheme, 2017; Ebekozien, 2021) on the subject, it is impossible to solve the housing shortage. Homeless individuals can be found in even the wealthiest countries. Forced eviction and homelessness are typical occurrences in Nigeria's major cities, such as Lagos, Kano, Port Harcourt, Ibadan, Owerri, and Kaduna, as well as several smaller towns. A population of more than 180 million and a city population of more than 35 percent make the housing situation extremely difficult. In fact, Saidu and Yeom (2020) predicted that by 2025, more than 62% of Nigerians will be residing in urban areas, given a population growth rate of 2.8%. A lack of housing, squalor, overpopulation, and bad living conditions characterize metropolitan areas today.

Abandoned housing developments, non-implementation of housing policies, and a disregard for the poor characterize housing at the national level. Oluleye, et al. (2020) cited a lack of resources as a major problem, along with affordability. Other issues with housing provision in Nigeria are linked

to policy instrument flaws and the consequences of such flaws. The challenges in house delivery can also be traced back to administrative constraints. The country has implemented a number of housing regulations and programs in order to address these issues. In terms of ensuring that everyone has adequate access to quality housing, Nigeria's housing policy reform currently faces a key dilemma: how to establish a delicate equilibrium between market reforms, government interference, and social mechanisms. As part of economic restructuring and reforms, the government is enacting deregulation measures in the financial markets (forex, commodities, commerce, and investment), as well as in the manufacturing sector (housing construction).

Research Methodology

A content analysis and assessment approach was utilized to gather and analyze trustworthy data on Nigerian housing policy concerns and housing condition outcomes in this expository research project. Researchers focused on gathering, analyzing, and appraising materials linked to the National Housing Policy of Nigeria (1991) and associated revision and implementation strategy documents. Nigeria's housing policies and problems were analyzed using books, existing records, written articles in the form of yearly reports and reviews and government documents, as well as academic articles on housing studies in general and conference papers from the field.

Results and Discussion

Housing Policies Performances in Nigeria

In 2003, the government of Nigeria redoubled its efforts to address the country's longstanding housing and urban development challenges by expanding the roles of several major housing delivery agencies and establishing a new Federal Ministry of Housing and Urban Development (from Ministry of Works and Housing). Table 1 below summarizes the accomplishments of Nigeria's housing policy over the country's five decades of independence to offer a different viewpoint on the country's housing history and performance.

Table 1: Housing Policies Performances in Nigeria

HOUSING PROGRAMME	MAIN FEATURES / PROJECTIONS	MAJOR ACHIEVEMENTS/ OUTPUT
National Development Plan (NDP-1) 1962-68	Industrial Estates, land acquisition, and Town Planning produced 24,000 housing units during the period.	As of 1967, only 500 units had been constructed. A performance level of 2.1%.
NDP-2 (1970-74)	As a result, housing became a source of social and political tension. The federal and state military governments should create and rent affordable housing for their personnel. Lagos will get 10,000 units, while the capitals of the other 11 states would get 4,000 units apiece. Distribution of housing units in accordance with socioeconomic groups: Low-income families make up 60%; middle-income families are 25%; and the high-income group is 15%. Additional government housing	A federal housing authority has been set up (FHA). Until 1976, the FHA was unable to function. More than 55,000 homes have been built in around 80 estates across the country, and the FHA has a land holding of about 11,000 hectares. The Federal Housing Administration has invested about N=32 billion in housing projects and supporting infrastructure.

	has been promised but has yet to be built. Loans for private homes for federal personnel have been revived and expanded. Additional government investment in the manufacturing of cement and other building supplies, as well as more importation of cement to meet the increased demand for cement from new house construction.	
NDP-3 (1975-80)	202, 000 dwelling units would be created each year, with 46,000 units in Lagos, 12,000 in Kaduna, and 8,000 in the other 17 state capitals; this is a total of 202, 000 homes every year. The FHA was responsible for providing the necessary infrastructure for the states to build the mandated number of units. It was a first for the Federal Housing Administration. For housing only, a new ministry was established: the Ministry of Housing, National Development and Environment (HNDE). Additional funding for the Federal Housing Administration (FHA) was provided for the efficient takeoff of direct building and growth of housing estates in several areas of the United States. For the first time in its history, Lagos State's civilian administration launched a five-year state housing plan for 50, 000 units in 1979. (1979-1983).	The actual number of units completed was 37,650. Representing a successful performance percentage of around 19%. Lagos State completed 47,200 units. In Nigeria's history of housing delivery, 94% is an exceptional mark.
NDP- 4 (1981-85)	To produce 2,000 housing units yearly in each of the 19 states of the federation	
National Housing Policy 1991	By the year 2000, all Nigerians should be able to afford or have access to suitable housing. To eliminate the housing problem by the year 2000, 730, 000 new dwelling units must be built each year. All levels of	NO VISIBLE IMPACT

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	government were encouraged and encouraged to participate in the delivery of housing. Institutions within the scheme were strengthened to operate in a more efficient manner. a focus on investments in housing that meet the most basic requirements boosted private sector involvement in the construction of new homes With a start-up grant of N250 million, the National Housing Fund was officially established in 1992.	
National Housing Program (1994-95)	Construction of 121,000 housing units for all income levels is planned. Newly formed state governments were given 5,000 units each, while the remaining 21 states were given 76,000 units.	Only 1,014 units were completed.
National Housing Policy (2002)	Expanded access to long-term, sustainable housing financing for all Nigerians by developing the mortgage finance industry. Initiated and promoted the involvement of Nigeria's Real Estate Developers Association (REDAN) in the provision of affordable housing in the country. to make it easier for state housing agencies to take a more active role in the provision of low-cost homes Real Estate Investment Trusts (REITs) have improved the housing supply chain. A restructured FMBN has been established to allow the secondary market operation of capital market platforms to provide long-term mortgage funding. The newly formed Ministry of Housing and Urban Development has been given responsibility for housing.	There has been no discernible impact to date. More than 14 million housing units remain unsold in the United States. According to HABITAT (2005), Nigerian home mortgages account for less than 1% of the country's total gross domestic product (GDP).
State Housing Corporations, States Owned Mortgage Banks, and States Housing	Almost all of Nigeria's state governments now have their own housing corporation, which they run well. Mortgage banks are also owned by most states, in addition to their housing corporations. In some cases,	All of Nigeria's states, as well as the Federal Capital Territory (FCT), have received a total of 3,705 housing units from the joint efforts of these institutions. ASK FOR DETAILS ON LSDPC,

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Ministries	these two institutions have been forced to work together with state ministries of land, housing, and urban development, FHA, FMBN, the African Development Bank (ADB), housing development-based NGOs, and organized private developers through Public Private Partnership (PPP) arrangements. It is most common to use the BOT approach (Build, Operate, and Transfer).	ANHCOL, the International Monetary Fund (IMF), KOGGI, etc.
FMBN	N100 billion in first-ever housing bonds, issued in two installments of N5 million apiece, have been issued. To comply with monetization policy, the money was utilized to let federal government employees buy non-essential homes in Abuja and the Federal Capital Territory (FCT).	The acquisition of almost 30,000 housing units was financed by the federal government.

Sources: Eerola (2021)

Problems Associated with Housing Policies in Nigeria

Execution and insufficient research on the policy's formulation and implementation, insufficient funding, a lack of skilled personnel in the building industry and a lack of infrastructure amenities are some of the difficulties related with the national housing policy, according to Lawal and Adekunle (2018) and Iheme (2017). Many other issues, such as rural-to-urban migration and a high rapid urbanisation, lack of effective planning, the growth of shanty towns, and the availability of substandard buildings, are discussed in Ebekozien (2021) and Saidu and Yeom (2020), respectively. Despite government efforts, housing shortages can be seen in both urban and rural areas. Rural-to-urban migration is a major factor in urban housing shortages. Adding to the difficulty is a naturally occurring population increase and the lack of impact of the housing strategy in rural areas. Houses in rural areas are typically in disrepair, with basic amenities such as running water, toilets, and a somewhat clean environment being the most common complaints (Festus & Amos, 2015).

For the same reasons, Oyebanji, et al. (2017) argued that land is the most important component of any housing plan. It has a significant impact on both the supply and demand of housing. All Nigerian towns have a high cost of land, and this problem is exacerbated by delays in the processing of Certificates of Occupancy (C of O) and clearance of construction plans. Other difficulties, such as low wages, high mortgage interest rates, high building material costs, a preference for imported building materials, and a lack of social services exacerbate this issue. In addition to environmental protection, social integration, and urban security and governance, the housing policy falls short in these areas. Above all, the country's ever-changing socioeconomic and political realities present a challenge to the policy (Oluleye, et al., 2020).

It has also been noted by Oluleye (2020) that the national housing strategy is not able to solve both the quantity and quality of housing issues. The ever-increasing demand for housing, which is not being fulfilled by the available supply, is a major contributor to the quality and quantity shortages

(Oyebanji, et al., 2017). The housing market's inertia is to blame for its inability to fulfill rising demand. As a result of this, there is a housing shortage in both urban and rural areas; hence, a strong housing policy becomes even more critical. So, an approach that addresses poverty, efficient and effective housing finance, availability of land, high costs of building materials and environmental management, as well as access to basic social services and other institutional mechanisms for housing delivery is needed.

Why Past Market-Efforts of Government Failed and May Still Fail

Poverty

It was pointed out by Aliu, et al. (2018) that planners of the housing programs did not take into considerations that the buildings they were about to create were intended for the poor. If they had, they would have seen that the houses they built were out of reach for those with less financial resources. They should have taken into account their financial situation.

High Cost of Housing Units

At a time when the middle and low-income groups were making less than N5000 a day, the housing units were put on the market at excessive prices. Middle and low-income individuals would have needed at least a lifetime to accumulate such a sum. Because of this, they tended to focus on slums (Eerola, 2021).

Access to Credit Facilities

According to Iheme, et al. (2015), both the government and private mortgage lenders refused to provide credit to people with low incomes. Low-income people lacked the collateral necessary by these organizations and hence were unable to meet the onerous administrative requirements.

Low Incentive to Investors

Lawal and Adekunle (2018) pointed out that poor incentives to investors are another reason why previous housing interventions have failed. They are rational and profit-oriented persons. The pleading of others is not enough for them. Even if the economic climate is favorable, there is no need to invest if there is no return on the investment. Investors prefer to keep their money in the bank if they cannot make a profit, so the government should provide tax breaks and other incentives. There is insufficient effective demand in Nigeria's housing sub-sector. Lawal and Adekunle (2018) predicted that a two-bedroom flat would sell for N2.8 million. Sadly, most people who can afford such a large sum of money prefer to build their own house rather than go through the arduous process of purchasing a ready-to-go residence. Cities like Port Harcourt, Aba, Lagos, and Onitsha are no strangers to this. As a result, an average worker thinks that with the same amount of money he/she will be able to progressively build up a three-bedroom flat or more in the near future. This means that individuals who can afford a two-bedroom home are not a part of the market demand for housing in Nigeria, while those who ask for it are unable to properly demand for it and make up the market demand. Because of this, entrepreneurs in the sub-sector have little or no motivation to participate. In fact, the country's large number of vacant homes serves as a sufficient deterrent to potential investors.

Housing Units Sited at the Periphery

National Low-Cost Housing (NLCH) programs are located on the periphery of cities, resulting in an increased cost of commuting to and from work for occupants who are city workers (Ebekozien, 2020). People who lived in these areas had to endure a lot of hardship and unhappiness as a result of lack of basic necessities like water, power, and well-maintained roads. This is why the worker would rather squat with family and friends in the city or reside in the slums.

Rural-Urban Drift

Rural-to-urban migration in Nigeria is another element that contributes to the country's housing woes. As more and more people move to cities in search of a better life, the cities become even more congested and their infrastructure becomes increasingly overburdened. Housing shortages in the country have already reached 34 million units (Eerola, 2021). Because of the current rural infrastructure conditions, it is unlikely that the housing programs will be able to succeed in the near future.

Conclusion

In conclusion, regardless of one's financial situation, a place to call home is an absolute necessity. Despite this, there is an inherent housing shortage which can be found in both urban and rural areas in Nigeria. Slum habitation, homelessness, overcrowding, squatter settlements, and poor housing units are all forms of urban housing problems in Nigeria. Rural areas are plagued by low-quality housing, bad environmental conditions, and a lack of infrastructure. One option to address the housing crisis is through the use of policy instruments. Nigerian Housing Policy was enacted in 1991 to solve the country's housing shortages in this way. In the Nigerian housing strategy, practicality, affordability, and a limited time schedule for the implementation of the programs were all taken into consideration. Nigeria's housing policies and programs have been capable of making considerable improvements in the production and delivery of housing to some extent. Nevertheless, the policies and programs are besieged by flaws such as poverty, rising construction and building material costs, homelessness, weak policy structures for housing provision, administrative backlogs in building permit and receipt of certificate of occupancy, programme review and monitoring and lots more.

Recommendations

The primary goal of housing program is to alleviate the burdens of homelessness. In order to accomplish this, the policy must be improved in order to be effective. As a result, Nigeria's housing policy must be examined on a regular basis in order to ensure that it is functional and acceptable to the public. Other than that, in order to achieve effective housing provision, there must be accessibility to land, financing, and construction supplies. Infrastructure, housing maintenance, and incentives for insurance companies should also be provided to support affordable home development. Low-income households should be considered in the development of housing policy. As a result, low-cost housing for low-income families should be made available.

Encouragement of locally sourced construction materials should be prioritized when designing for low-income households. Furthermore, a realistic housing goal must take into account slum upgrading, regular maintenance, and urban regeneration. Institutional structures, housing finance, low-income rural housing, and urban model government housing should all be included in housing delivery methods. In addition to government support, incentives, loans, and subsidies should be used to encourage the private sector to build more homes. It is also necessary to provide financial resources to the Federal Mortgage Bank of Nigeria, which is tasked with overseeing and managing the activities of Nigeria's mortgage institutions.

Building sites should also be accessible and easily available for prospective home owners. Building plans approval and the issue of a certificate of occupancy must be expedited and simplified in the same way. Additionally, promoting the mass manufacturing of construction materials is essential. This will allow the resources to be more accessible to those who cannot buy them. Individuals should be encouraged to build their own homes utilizing low-cost financing schemes as a viable alternative to mass housing. REDAN, the Nigerian Real Estate Development Association, and other housing-related organizations should be given government support to grow and prosper.

Public policy makers must also comprehend how vital policy research is to the process of building new homes. An investigation of housing policy should concentrate on the policy's goals and objectives and how they are achieved through its implementation and review. Financing strategies and programs, slum upgrading and institutional support for the building and delivery of homes are among the other recommendations. These are the tenets of environmentally friendly housing.

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Roles of Lactation Consultant in Lactation Management

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Abstract:

Breast milk is regarded as ideal, natural and protective food for newborns. Breastfeeding is a natural and critical act that provides energy and nutrients that the child needs at first half of infancy, up to half or more and one third of the child's nutritional and energy needs during the second half of infancy and the second year of life. Global breastfeeding scorecards revealed only 41% of infants are exclusively breastfed which is far from the global target of 70% by 2030. Though in Nigeria, the initiation of breastfeeding has improved the practice and duration of exclusive breastfeeding remains low. Previous breast surgery, flat or inverted nipples, insufficient glandular development, Sheehan syndrome, unilateral involution are among the challenges of breastfeeding. There are several factors responsible for the non-compliance of mothers towards exclusive breastfeeding which include; education, social class, culture, location, nature of work, lack of time, lack of knowledge, lack of support from the husband and family members, health status of both the nursing mothers and their infants. The resurgence of professionals who has interest in promoting breastfeeding; lactation consultant is now very common. Nurses who have acquired sufficient knowledge, expertise, and experience are commonly seen as lactation educators or breastfeeding specialist. They are clinically competent to assist and support the mother-infant pair, identify common breastfeeding problems and its managements, and early identification of illness. A lactation consultant can work in many different settings like postpartum hospital units, freestanding birth centers, pediatric offices, and public health clinics. Some lactation consultants choose to work independently. Lactation consultants care for women of childbearing age and their newborn babies. A lactation consultant usually works during the day shift, but that may vary depending on where they work.

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Introduction

Clinical lactation management is the science and art of assisting women and infants with breastfeeding. Breastfeeding is now being taught, by lecture and by clinical example. Because the mother-infant pair is dynamically interrelated for breastfeeding, it is imperative to consider both individuals when attempting to assess and "manage" breastfeeding. Multidisciplinary input is desirable and often critical. Breastfeeding is a natural and critical act that provides optimally, the energy and nutrients required to satisfy all the needs of the child during the first half of infancy and subsequently providing, up to half or more and one third of the child's nutritional and energy needs during the second half of infancy and the second year of life respectively (World Health Organization, 2018).

According to Global breastfeeding scorecards, (2018), only 41% of infants are exclusive breastfed globally in the first six months of life which is still far from the 2030 global target of 70%, Two-thirds of mothers continue breastfeeding till one year of age and by two years, the rate drops further to 45%. In Nigeria although the initiation of breastfeeding has improved, the practice and duration of exclusive breastfeeding remains low. (NPC, 2019), According to the 2018 Nigeria Demographic and Health Survey, 42% of children commence breastfeeding in the first hour of life with only 29% of children exclusively breastfed in the first six months of life.

During the past 5 years, with the resurgence of professional and lay interest in the promotion of breastfeeding, it has become increasingly common to encounter nurses who are lactation consultants. It is also becoming increasingly common for nurses to become "lactation educators" or "breastfeeding specialists" once they have acquired sufficient knowledge, expertise, and experience. These individuals have an in-depth knowledge of early breastfeeding management and problem solving; they also are clinically competent to assist and support the mother-infant pair. Their particular areas of expertise include (but are not limited to): understanding the anatomy and physiology of lactation, facilitating immediate breastfeeding postpartum; proper positioning and latch-on of the infant at the breast; preventing postpartum breastfeeding problems by frequent, effective feedings; assisting the mother in learning to recognize and respond to infant cues; and recognizing and managing common problems such as a sleepy baby, a fussy baby, latch-on difficulties, sore nipples, engorgement, and perceived low milk supply. It is imperative that these specialists have enough experience with young infants to recognize illness. As with other consultations that involve delegation of care, the physician continues to oversee and coordinate the management of the infant. If the physician refers patients to the lactation consultant for detailed feeding assessment and assistance and if communication is open, the lactation consultant can feel comfortable in working with the physician on more complex medically related feeding problems.

Concept and Importance of Breast Milk

Breast milk contains all the nutrients infant requirements in the first six months of life. It protects against common and wide spread childhood diseases such as diarrhea and pneumonia, and may also have longer-term benefits such as lowering mean blood pressure and cholesterol, and reducing the prevalence of obesity and type-2 diabetes.

To enable mothers to establish and sustain exclusive breastfeeding for 6months, WHO and UNICEF recommend:

- Initiation of breastfeeding within the first hour of life.
- Exclusive breastfeeding that is the infant only receives breast milk without any additional food or drink, not even water.
- Breastfeeding on demand that is as often as the child wants, day and night.

- No use of bottles, teats or pacifiers.

Human milk varies in its composition with the following;

- The time of day: Fat content is lowest in the morning and highest in the afternoon.
- The stage of lactation: The fat and protein content of colostrum is higher than in mature milk.
- Maternal Nutrition: Although the total amount of fat is not influenced by diet, the type of fat that appears in the milk will be influenced by what the mother eats.
- Individual variation.

Breast milk contains Fat and fatty acid 98%, Carbohydrates 40%, Protein 1.4g, Vitamin (fat soluble) 1g, mineral (trace element) 3.3mg, enzymes 1%, water 9%.

Colostrum is the first breast milk given to a baby by the mother or a wet nurse which provides all nutritional requirements of an infant birth. It continues to supply majority of a baby's nutritional needs for up to eighteen months (WHO, 2018). It contains antibodies which provide immunity against microorganisms entering the body (Palmeira & Carnoeiro-Sampaio, 2019) and critical for sustaining a new born infant's health and well-being. The colostrum (first breast milk) is pure, nutritious and rich in antibodies that shield newborns from illnesses. The colostrum is the first immunization a child receives, laced with immunoglobulin that protects the newborn, creates a mild laxative effect, and expels meconium and helps check the buildup of bilirubin (Elyas, et al., 2018). Breastfeeding aids proper mandible, dental and speech development (Okogba, 2018), enhances mothers' well-being, child - spacing, shrinks ovarian and breast cancer risks, boosts household and national resources, secures feeding and promotes environmental safety (WHO, 2019).

Breast milk is regarded as ideal, natural and protective food for newborns. Given that prolonging people's lives (by reducing mortality) and preventing disease (by reducing morbidity) are some of the goals of public health (Brulde, 2019), breastfeeding or exclusive breastfeeding has been recognized as an efficient advance to the achievement of these goals. In a study by Vennemann et al (2019) breastfeeding was found to be protective against sudden infant death syndrome by reducing the risk by 50% at all ages during infancy; these benefits have been reported to exhibit dose-response relationship, that is, health gains increases with increases in duration and exclusivity.

There is a universal consensus about the fundamental importance of breastfeeding for children`s adequate growth and development and for their physical and mental health (WHO, 2019). Breastfeeding, particularly exclusive breastfeeding, and appropriate complementary feeding practices are universally accepted as essential elements for the satisfactory growth and development of infants as well as for prevention of childhood illness. Exclusive breastfeeding defined by World Health Organization (WHO) as practice of feeding only breast milk (including expressed breast milk) and allows the baby to receive vitamins, minerals or medicines and water, breast milk substitutes, other liquids and solid foods are excluded.

Breast milk promotes sensory and cognitive development, and protects the infant against infectious and chronic diseases. Exclusive breastfeeding reduces infant mortality due to common childhood illnesses such as diarrhea or pneumonia, and helps for a quicker recovery during illness.

These effects can be measured in resource-poor and affluent societies (Kramer et al, 2018). Breastfeeding contributes to the health and well-being of mothers; it helps to space children, reduces the risk of ovarian cancer and breast cancer, increases family and national resources, is a secure way of feeding and is safe for the environment (WHO, 2019). At the point when sufficient and significant mediations conveyed, breastfeeding are responsive and can improve quickly. Best

results accomplished when intercessions actualized through a few channels (Arage & Gedamu, 2019).

Breastfeeding reduces the mother's risk of fatal postpartum hemorrhage and pre-menopausal breast and ovarian cancer. Frequent and exclusive breastfeeding contributes to a delay in the return of fertility and helps protect women against anemia by conserving iron. Breastfeeding provides frequent interaction between mother and infant, fostering emotional bonds, a sense of security, and stimulus to the baby's developing brain (WHO, 2019).

Anatomy and Physiology of Breastfeeding

Physicians must understand several essential underlying anatomic and physiologic considerations thoroughly as they assist the breastfeeding mother and baby. Pregnancy provides optimal preparation of the breasts for subsequent feeding. The only further preparation required is that of clinicians: obtaining a careful history, examining the breasts, and communicating any concerns to colleagues. A complete breastfeeding history includes exploration of the feeding decision, previous breastfeeding history, previous postpartum hemorrhage (possible Sheehan syndrome), previous breast surgery (cosmetic or reconstructive surgery, biopsies), cardiac or chest wall surgery, breast trauma (for example a burn that has caused scarring), questions regarding breast changes during pregnancy, family history of breast cancer, and any other concerns the mother may have about her breasts or about the feeding process.

Challenges of Breastfeeding

Breastfeeding enhances the interaction between mother and child and help the child derive the benefits of its mother's milk provided directly from the breast to the child, and offers unique experience to them each time (Primo & Marcos, 2019). Milk production offers a use or loses it process and according to Bonyata (2018), the more often and effectively an infant is nursed, the more milk the mother will make. Human breast milk contains hundreds to thousands of distinct bioactive molecules that protect against infection and inflammation, contribute to immune maturation, organ development and healthy microbial colonization with molecules such as colostrum, fat and protein. However, there are some challenges that could hinder breastfeeding which are discussed below

Breast Surgery

Previous breast surgery has the potential to interfere with lactation. Breast reduction, in particular, usually involves significant cutting of ducts or nerves that could impair the lactation process. Breast augmentation tends to be associated with great anxiety on the part of the pregnant and lactating woman about the possibility of causing illness in her infant. Most breastfeeding experts see no strong evidence to support ill effects in the infants of these women. If breast augmentation was performed to correct a developmental anomaly of the breasts, lactation performance may have been impaired prior to surgery. In all women who have had breast surgery, breastfeeding care should be individualized and the infant followed frequently during the first few weeks for appropriate weight gain.

Flat, Retractile or Inverted Nipples

No specific intervention is required for bilateral inverted or retractile nipples in early pregnancy. (If one nipple normally is protuberant, the infant can nurse totally from that breast.) If both nipples remain inverted near term, the woman may require extra attention to intrapartum management, should be cautioned to avoid artificial nipples and pacifiers, or may need extra skilled assistance with early feeding. Use of a breast pump just prior to feeding may be beneficial in pulling the nipple and areola out further and helping to initiate let-down. The prenatal use of breast shells (also called

milk cups), although widespread, is controversial. Theoretically, the shell allows the nipple to protrude through the hole in the plastic and gradually stretch the fibers that are "tethering" the inverted nipple.

Insufficient Glandular Development

"Insufficient glandular development" of the breast (sometimes called "primary lactation failure") is characterized by immature-appearing breast(s). Striking asymmetry is present in the unilateral form, although bilateral underdevelopment also has been documented. Some women may have had cosmetic surgery to correct the appearance of the anomaly. Other major features include little or no breast growth during pregnancy and lack of physiologic engorgement postpartum. Hormone levels, including prolactin, are normal. In general, small breasts will produce normal amounts of milk. However, small, immature, or asymmetric breasts that do not respond to pregnancy by enlarging suggest the possibility of anomalous development.

The obstetrician should inform the pediatrician of this condition and the pediatrician should incorporate questions about breast changes into the maternal history taking. Close follow-up of the infant is mandatory, with weight checks every 2 to 3 days, because these babies can develop significant dehydration or hypoglycemia quite rapidly. Because insufficient glandular development of the breast is a clinical diagnosis and is rare (probably less than 1 per 1,000 women of childbearing age), the breastfeeding experience should be encouraged until signs and symptoms are definite. Infants should receive early supplementation to avoid significant dehydration following overzealous attempts to stimulate the milk supply with frequent suckling. Despite frequent and effective milk extraction, these breasts cannot be stimulated into full production; partial breastfeeding, using a supplementer, is an option for some women.

Sheehan Syndrome

Loss of anterior pituitary function (and subsequent loss of prolactin, thyroid hormone, cortisol, and gonadotropins) following severe postpartum hemorrhage. The hypotension associated with the blood loss decreases perfusion to the pituitary. Lactogenesis does not occur due to absent or deficient prolactin levels. Frequently the diagnosis of this syndrome is delayed for years beyond the initiating event.

Unilateral Involution

One breast ceases milk production while the other continues. Because ongoing milk production is regulated locally, continued milk production is regulated independently in each breast. The side that involutes will be somewhat smaller than the side that is producing milk until complete weaning has occurred on both sides.

Painful Feedings

Persistent pain during breastfeeding is not normal. During the first 2 weeks, brief discomfort can occur for a minute or so when the newborn is latching-on. If pain continues after the initial latch-on, the infant should be removed and reattached to ensure proper latch-on, let-down reflex, and swallowing. If pain arises during the course of feeding, the baby should be removed and switched to the other breast if still hungry.

Another cause of sore nipples during the first few days is infant oral-motor dysfunction (abnormal suck pattern). The pediatrician or lactation specialist should examine the infant completely and ensure that positioning and latch-on are optimal. After feeding, the mother's nipple may appear creased, ridged, flattened, pointed, or otherwise misshapen. The diagnosis and treatment of breastfeeding problems related to oral-motor dysfunction require consultation with a knowledgeable and skilled professional (lactation consultant or specialist, often in conjunction with

an infant feeding specialist). Later in lactation, *Candida* infection of the nipple/areola complex may present as new onset of sore nipples or breast pain (the pain often is described as having a burning or stabbing quality). The clinical diagnosis is made when there is a preceding history of antibiotic usage, thrush (infant) or dermatitis (infant), or maternal candidal vaginitis in combination with maternal nipple pain and/or dermatitis.

Practice of Breastfeeding

After delivery of the healthy term infant, immediate and sustained contact between mother and infant strongly correlates with longer durations of breastfeeding. The infant can be dried, assigned Apgar scores, and visually inspected as it receives skin-to-skin contact with the mother. Both mother and baby can be covered with warm blankets if the room temperature is cool. Skin-to-skin contact also accelerates infant temperature stability and normalization of blood glucose and improves acid base status. For the healthy dyad, skin-to-skin contact should occur for at least 1 to 2 hours after delivery. Even short interruptions for cleaning, eye prophylaxis, administration of vitamin K, weighing, and other procedures have been documented to reduce breastfeeding success. These first hours following birth, when mother and infant are alert, allow time for maternal-infant bonding, imprinting, oxytocin release, and nutritive feeding with actual intake of colostrum. It is essential for an experienced health professional to observe and assist with at least one feeding in the hospital to document good latch-on. If the first feeding in the alert period is not optimal, the infant may be sleepy for up to 48 hours. Parent needs to be assisted to keep baby awake at times of feed.

According to a study conducted by Essien, et al (2018) on practices of exclusive breastfeeding in Calabar, revealed that the majority of the respondents (60%) did not practice exclusive breastfeeding while 40% practice exclusive breastfeeding. This disagrees with Maduforo, et al (2018) on the practice of exclusive breastfeeding by nursing Mothers in Owerri Metropolis, which showed that only 36.41% were practicing it in that area. Similarly, this disagrees with Leon-Cava, et al (2018), which observed that improved breastfeeding practices are crucial for child growth and development.

Kramer and Kakuma (2019) revealed that 63% initiated breast feeding immediately (30minutes) after delivery, while 37% did so long after 30minutes. This disagrees with study of baby friendly hospital Initiative (BFHI) 2018, which was designed to promote early initiation of breastfeeding, preferably immediately after birth, this study observed that (53%) of the mothers did not initiate breastfeeding immediately after birth.

According to study carried out by Akpor, et al (2018) 46.3% of the participants breastfed their babies so as to ensure the child's wellbeing and 36.8% also signify bonding/closeness to baby has their reason. Only 10.5% and 6.3% of the participants mentioned money and family/cultural beliefs respectively as their main reasons for breastfeeding and this is compared to the study carried out by WHO 2018, indicate that the practice of exclusive breastfeeding in the first six months of life builds the child immunity, protects the child from diarrhea, respiratory diseases, bonding/closeness and improves the child response to vaccination. And also encourages uterine involutions, thus helps the mother to regain her pre-gravid body weight and shape. Also research conducted by WHO, 2019 state that 54.4% practiced it for 6months, 27% practiced it for less 6 months, while 18.6% practiced it more than 6months.

In a cross - sectional study done in South Sudan, Warille (2019) found that 63.2% of mothers practice exclusive breastfeeding for the first six months, 70% had skin-to-skin contact immediately after birth and 76.8% of mothers actually initiated breastfeeding in the first hour of delivery.

Antenatal visits to hospitals/ health care units educate mothers on the significance and benefits of breastfeeding, and influences the decision to breastfed and boosts mothers' confidence in breastfeeding. Piro and Ahmed (2020) posits that mothers who attended antenatal classes are more likely to breastfeeding than those who did not attend the classes. Studies have revealed that infants whose mothers did not attend prenatal breastfeeding class were five times more likely to receive infant formula supplement in the hospital than the infants whose mothers attended (Habtewold, et al, 2019). It has been reported that mothers who delivered normally are likely to breastfeed than those who delivered through caesarian (Saco, et al, 2019).

Evidence from Shrimpton (2018), shows that in developing countries the greatest risk of nutritional deficiency and growth retardation occurs in children between 3 and 15 months of age, a period noted for sub optimal breastfeeding and inadequate complementary feeding practices and this agrees with the findings from recent studies of Edmond, et al (2020) stressed the risk of delayed onset of breastfeeding on neonatal mortality in sub-Saharan Africa and showed that neonatal mortality could be significantly reduced by 16% if the mothers started breastfeeding at day one and 22% when breastfeeding was commenced within the first hour. Evidenced from Ogunleye, et al (2018) revealed that 40% of the respondents breastfed their babies on demand in a day, 38% breastfed their babies between the ranges 5-8 times, while 22% breastfed between the ranges 0-3 times in a day.

Agunbiade and Ogunleye (2020) studied exclusive breastfeeding and has concluded that there are several factors responsible for the non-compliance of mothers towards exclusive breastfeeding which include; education, social class, culture, location, nature of work, and health status of both the nursing mothers and their infants. Prominent among these values and behaviors are western education and formal employment. However, some constraints were identified to be responsible e.g. lack of time, lack of knowledge, lack of support from the husband and family members. Also Eze, et al (2019) conducted a research on reasons why some mothers did not practice exclusive breastfeeding their babies/ infants and it was revealed that Majority 63.3% of the respondents responded that it was due to house chores, 11.7% mentioned work schedules as the reason for not practicing Exclusive Breastfeeding, 9.50% mentioned that it was due to low breast milk production, 10.90% indicated that it was due to family influence, while 4.50% mentioned that it was due to swollen breasts or sore nipples.

Roles of a Lactation Consultant

A lactation consultant nurse is a nurse that specializes in the clinical management of lactation and breastfeeding. Lactation consultants are specialists who train mothers how to breastfeed their babies. The lactation consultant provides the majority of breastfeeding education during the postpartum period but may begin their consultation and education during a woman's pregnancy. A lactation consultant provides breastfeeding support, assists with lactation care, and educates patients to overcome obstacles and concerns with breastfeeding.

A lactation consultant can work in many different settings like postpartum hospital units, freestanding birth centers, pediatric offices, and public health clinics. Some lactation consultants choose to work independently. Lactation consultants care for women of childbearing age and their newborn babies. A lactation consultant usually works during the day shift, but that may vary depending on where they work. Some hospital-based lactation consultants will work on holidays and weekends, but will typically be compensated at a higher rate for these shifts.

A lactation consultant is skilled in caring for patients who are experiencing breastfeeding issues like painful nursing, decreased milk production, latching difficulties, and babies with low weight

gain. The lactation consultant works closely with the patient to understand how to latch their baby to the breast, the various breastfeeding positions, and how to tell if a baby is transferring and drinking enough milk. Lactation consultants are familiar with breast pumping equipment that assists with babies who are unable to transfer milk or moms who must return to work or be separated from their child. They also give mothers breast milk storage tips, tips for how to deal with painful and cracked nipples, and how to make sure their baby is getting enough milk.

Lactation consultants must be familiar with chronic and acute conditions and if there are any implications with breastfeeding a newborn baby. A lactation consultant must possess a considerable range of knowledge regarding the compatibility of medications with breastfeeding. Hence, lactation consultants must possess a broad range of clinical knowledge and when to appropriately refer a client. A lactation consultant can make or break the difference in a breastfeeding relationship between mother and baby. They are compassionate, patient, and empowering.

Conclusion

In conclusion, exclusive breastfeeding help in dispersing number of child since it is one of the family planning techniques as it defers the arrival of the fruitfulness pace of mother and in long haul, likewise decreases type-2 diabetes, breast ovarian, and the uterine malignant growth. There is need for lactation consultants to continuously educate women on lactation management and benefits of breastfeeding.

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