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Aims

The aims of The African Journal of Behavioural and Scale Development Research (AJB-SDR) are to: (i) provide a platform for researchers in behavioural fields to disseminate their research findings in Africa and beyond, (ii) promote the use of modern analytical approaches that will give research work in Africa credibility and global acceptance, (iii) facilitate the publication of quality articles presented by scholars all over the world during annual forum of the Association of the Behavioural Research Analysts and Psychometricians which is held in various regions, (iv) promote professional relationship and exchange of ideas among scholars that are devoted to scale development research and (v) provide a medium for disseminate empirical- based information on modern theories in the field of scale development.

Publication Details

The African Journal of Behavioural and Scale Development Research (AJB-SDR) is owned and published by the Association of Behavioural Research Analysts and Psychometricians (AB-ReAP). The journal is published biannually; *two issues in a year*. Each shall have both print and online versions. Both local and overseas subscription shall be made through the pay platform on AB-ReAP website, www.abreap.org. All correspondence should be directed to the Editor-in-Chief through info@abreap.org and copy joadeleke@yahoo.com.

Exploring modern analytical tools in Behavioural and Scale Development Research

The aim of publishing the current issue is to make available articles that will educate readers on the use of sundry statistical tools to answer research questions and develop credible measuring scales. Arowojolu and Onuka made use of Descriptive statistics, Analysis of Variance (ANOVA) and Partial Least Squares (PLS) to provide answers to the stated questions in the their work titled: **Assessment of Contributions of Demographic Variables to the Levels of Possession of Work Skills among University Senior Non-Teaching Staff in Ogun State, Nigeria**. Oladipo-Abodunwa et al used a new approach to develop a scaled named: **Student Mathematics Engagement Scale**. The authors used Exploratory factor analysis (EFA), Horn parallel analysis (HPA), confirmatory factor analysis (CFA) and Ordinal alpha reliability coefficient They also used R- programming version 3.4.0 for EFA to establish interaction between the scale items and their components. Other analytical approaches used by the authors are, independent model Chi-square analysis using maximum likelihood estimates, Principal axis factoring extraction method with oblimin rotation and horn parallel analysis. The authors also itemised cut points by Kline, (2005) that can assist prospective researchers in the field of scale development: values of chi-square ($\chi^2 \geq 1$), Probability level ($p \geq 0.05$), degree of freedom ($df \geq 1$), Tucker-Lewis index (TLI ≥ 0.95), adjusted goodness of fit index (AGFI ≈ 1), goodness of fit index (GFI < 0.95), Normed fit index (NFI ≥ 0.95), incremental fit index (IFI ≥ 0.90) comparative fit index (CFI ≥ 0.90), Root mean square residual (SRMR ≤ 0.08) and root-mean-square error of approximation (RMSEA ≤ 0.06). Jimoh also used Content Validity Index (CVI) and percentages to carry out a study titled **Critical Thinking as a Correlate of Numeracy Learning Outcome Among Middle Basic Pupils in Kwara State, Nigeria**. Gbenga-Akanmu also reported the results of the study titled **Enhancing Retention and Performance in Numeracy Concepts through Meta-cognitive Training in Computer-mediated Classrooms** using Mean, standard error and Analysis of Covariance (ANCOVA). Onasoga et al used frequency, percentages and independent t-test to present results of the work titled **Nurses' Perception on Factors Responsible for Workplace Violence against Nurses in Selected Hospitals in Ilorin, Kwara State**. Other authors used various statistical tools too, because of the empirical nature of all the articles.

J. O. Adeleke
Editor-in-Chief

The African Journal of Behavioural and Scale Development Research Publication Guidelines

The African Journal of Behavioural and Scale Development Research (AJB-SDR) will be publishing articles by members of the Association of Behavioural Research Analysts and Psychometricians (AJB-SDR). Exceptions will be made for a non-member who is a co-author with a member, or who is invited to write for a special issue of the journal, or for other special/specific reasons.

- Articles submitted to AJB-SDR must be written in English, following manuscript guidelines (see below) and will be anonymously reviewed by referees. The editors will notify the senior author of the manuscript if it does not meet submission requirements.
- Articles are judged for (a) significance to the field of behavioural research and scale development from a global perspective, (b) comprehensiveness of the literature review, (c) clarity of presentation, and (d) adequacy of evidence for conclusions. Research manuscripts are also evaluated for adequacy of the rationale and appropriateness of the design and analysis. Scholarly relevance is crucial. Be sure to evaluate your information. Articles should move beyond description to present inquiry, critical analysis and must provoke discussions.
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Manuscript Guidelines

- Manuscript length, including all references, tables, charts, or figures, should be 3,000 to 5,000 words. **Maximum length is 6,000 words.** Shorter pieces of 1500-3000 words, such as policy review or critique papers are welcomed.
- All text should be double-spaced, with margin 1 inch (2.5 cm) all round and left and right justified.
- Paragraphs should be indented using the “tab” key on the keyboard. No extra spacing should be between paragraphs.
- Tables, Figures, and Charts should be kept to a minimum (not more than 4 per article) and sized to fit between 5.5 x 8.5 inches or 14 x 20 cm
- Abstract should be limited to 100-200 words.
- Include four or five keywords for database referencing; place immediately after the abstract.
- Cover page shall include the following information: Title of the manuscript; name(s) of author, institution(s), complete mailing address, email address, business and home (mobile) phone

numbers, and fax number. Also on the cover page, please include a brief biographical sketch, background, and areas of specialisation for each author. Please do not exceed 30 words per author.

SUBMISSION REQUIREMENTS

All articles should be submitted directly to Dr. Simeon Ariyo at simeonariyo@yahoo.com for text similarity test. Only articles that meet the

requirement of maximum of 15% similarity index will be forwarded to the reviewers for assessment.

NOTE

AB-ReAP adapted Journal guidelines of International Society for Teacher Education (ISfTE)

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Assessment of contributions of demographic variables to the levels of possession of work skills among University senior non-teaching staff in Ogun State, Nigeria

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Abstract

Work skills play a germane role in productivity of employees of any organisation. It entails technical, human and conceptual skills. This study assessed levels of possession of work skills among University Senior Non-teaching Staff (USNS) in Ogun State, Nigeria. Descriptive survey research design was used. Three research questions guided the study. The population consists of all USNS who are on Consolidated Tertiary Salary Scale (CONTISS) 6 to 12 in Ogun State. Stratified random sampling and simple random sampling technique were used to select 3 Universities and 381 USNS respectively. A scale was used by the heads of Departments to rate the levels of possession of work skills of the selected USNS and it was used for data collection. It was validated and the reliability coefficient was 0.9. Descriptive statistics, ANOVA and Partial Least Square (PLS) were used to answer the research questions. The result showed that the USNS possess the required work skills. However, only academic qualification contributes significantly to the possession of work skills and there was no significant difference in the possession of work skills, among University Senior Non-teaching Staff, along school ownership. Recommendations centred on encouragement of staff development policy.

Keywords: *Work skills, technical skills, human skills and conceptual skills*

Introduction

Work skills became germane and a cherished concept in the workplace in the late 20th century due to change in the rules for work especially when personnel were assessed by a new yardstick that consists of smartness, training, expertise, self management, and managing colleagues in the workplace. They are also employability skills, general skills that cut across all jobs/professions. They are foundational academic, intrapersonal and interpersonal abilities. These skills transcend educational degrees, certifications and licenses in the workplace due to its importance. The ways of conceiving work skills construct reflects that these skills consist of components of both hard/technical skills and soft skills.

Finch and Madux (2006) defined work skills as special knowledge and abilities used to perform specified task. Most of these skills are latent in nature but observable in an individual because they are evident in individual's attitudes, habits and values. These skills are: efficiency, timeliness organisational skills, commitment, self-confidence, competency/proficiency, leadership

skills, communication skills, adaptability, flexibility, problem solving expression on paper/writing skills, team work, self management, record management, numerical ability, conscientiousness, punctuality, creativity, presentation skills, integrity, honesty, fidelity, respect, courteousness, networking, helping others, ability to learn from criticism, knowledge management, patience/perseverance, resilience, acuteness, alertness, proactive skill, proper appearance, analytical skills, persuasiveness, conflict resolution, assertiveness, versatility, resourcefulness, effectiveness, adroitness, innovation, time management, anger management, quality of work, information management, motivation, accuracy, responsiveness, work ethics, stress management and enthusiasm.

Katz (1955) and Brady (1983) categorized work skills into three: technical, conceptual and human skills. According to Brady (1983), technical skills are special abilities needed to perform a specific task or job (skills that accompany competencies), these are data analysis, writing clearly, planning/event planning, computer competencies, ability to

organise and prioritise task (time management) among others. Conceptual skills are ability to think creatively and work with ideas. It consists of analytical skills, critical thinking, comprehension, conscientiousness and safety to mention but a few. These skills were in demand simply to enable workers to get along with their fellow colleagues and supervisors in order to enable them perform, make sound and critical decisions.

The University Senior Non-teaching Staff (USNS) also referred to as Senior Non-Teaching (SNT) is one of the two categories of staff in the University. It is heterogeneous in nature due to different group of professionals that are in this category of staff in the University system. These staff are in different units: Registry, Bursary, Information Communication Technology (ICT) Centre, Academic Planning Unit, University Health Services, Library, Works and Services, Physical Planning Unit, Sports Centre, Public Relations Unit, Internal Audit and Science Laboratory/Technologists/Technical Unit (University of Agriculture, Abeokuta Career Structure, 2013).

The University Senior Non-teaching Staff perform supporting roles to the academic staff in the University system. In addition, they attend to members of the University community; the Academic staff, students and the 'town'. According to Nwosu, Olaore, Oyenuga and Oladipo (2014), the Non-teaching staff services are indispensable and critical to the survival, thriving of the Institution and achieving excellence as a team. The USNS are responsible for many activities in the University.

The administrative staffers are responsible for the smooth running of day-to-day administrative duties in the University, the physical planning staff are in charge of the infrastructural setup, the staff in Works and Services are responsible for maintenance of infrastructure and teaching materials, the Library and ICT staff maintain the online Library and internet services respectively. The Bursary and the Internal Audit Units see to the financial compliance of the students and disbursement of fund for both fixed and recurrent projects. The Counselors also provide guidance and support for the students among

others. In order to perform these duties, the USNS need these skills in form of input. These inputs were assessed to determine their performance. Nevertheless, there are some specific skills and job knowledge (administrative knowledge) that are common and relevant to the job, which they perform to enhance productivity.

One pertinent question at this juncture is: are the USNS competent and equipped with the necessary skills to perform these tasks effectively? Evers, Rush and Berdrow (2001), noted that the general employability skills required in the labour market in recent times do not appear to be well-developed by University graduates. Jimoh (2008) carried out a research on Situational judgment, emotional labour conscientiousness and demographic factors as predictors of job performance among University administrative workers in South-Western Nigeria. Jimoh found that job performance of the University professional Administrators was dwindling due to incompetence of the professional Administrators. It was further stated that in spite of the incompetence of these staff, they still enjoyed their promotion as at when due. According to Evers, Rush and Berdrow (2001), and Jimoh (2008) submissions, it can be inferred that some of these University graduates eventually get employed into the University system as non-teaching staff without the necessary skills to aid productivity. Iwintolu (2014) submitted that there was discrepancy between the School and the Industry due to the lethargic nature of the Nigerian University education curriculum.

A lot of research have been conducted on the positive and negative effects of the demographic factors: age of staff, staff years of experience, school ownership, staff academic qualification and years of existence (age) of institution on possession of work skills and job performance. According to Krampe and Charnes (2006), continuous practice is necessary in order to sustain a high level of performance. Krampe and Cherness noted that specific practice appears important for maintaining skills, or facilitating the development of compensatory mechanisms as an adaptation to age-related declines. Meinz (2000) argued that simple accumulation of

experience was not sufficient to attenuate the effects of age. Krampe and Ericsson (1996) measured the older amateur pianists with 40 years of experience in music and found that this in itself was not enough to prevent decline in both general and domain-specific skills. These findings were mirrored in medicine and accounting where performance of professionals has shown declines subsequent to the end of formal training, despite increasing years of experience in the field.

Years of experience ought to enrich experience of employees because it gives an older employee a superior understanding of how job is done efficiently such that it saves the establishment's money. Also, the pride of a job well done, is evident in the older employees. Researchers have discovered that younger employees do not concern themselves with job well done. Owolabi and Adedayo (2012) noted that experience of a teacher is significant at impacting the students' academic performance in Physics. Work experience provides many benefits, giving you skills and experience that will allow you stand out to potential employers as well as helping you choose the right sector to work in. To be more employable, higher academic qualification is a tremendous asset, but it is not the only way to stand out to potential employers. Work experience also helps employees to differentiate themselves, which is an important factor when competition for jobs is so fierce. Work experience is an important part with regards to getting employment opportunities. Work experience helps in building useful skills that cannot be taught in the classroom. Work experience empowers new talent and gives employee the edge to push for the most sought after graduate positions in diverse fields. Work experience equips an employee with certain soft skills such as team working, communication skills and commercial awareness, all of which are sought after by employers, especially at graduate level.

Besides, Sampson (2004) and Miller and Birch (2007) shared a view that private schools are more likely to have greater financial resources which aid provision of facilities. In their conclusion, they maintained that the type of school affects the academic performance of students. Miller and Birch (2007) hypothesize that student's school background is positively related to academic performance of undergraduate students. In the same vein, Crosne, Johnson and Elder (2004) found that school ownership (that is schools owned by

private individuals and those owned by the government) is an important structural component of the school. Crosne *et. al* (2004) found that additional funding of private schools leads to better academic performance and more access to resources such as computers.

Wachira (2016) carried out a research on effects of personal characteristics on performance of University Non-teaching staff and stated that staff who acquired additional qualifications on personal efforts were not rewarded accordingly and they lack advanced skills and competencies. The prestige associated with the age of a University coupled with Staff years of experience in the University makes most people consider it as a major factor that in forms the general insistence by most that the standard of learning is higher in older public institutions. This is also supposed to be applicable to the workforce in the institutions. On the contrary, researchers such as Jimoh (2008) proved this wrong. Jimoh found that staff in older Universities lack committed staff. Maha (2015) and Kuchava (2016) noted that older institutions refused to automate several core processes that can be easily managed using a system. However, recently as a result of global advancement in technology, these older Universities have started using computer for record keeping.

The aim of this study are to find out:

1. the extent to which the University Senior Non-teaching Staff (USNS) in Ogun State Nigeria possess different work skills.
2. the difference in possession of work skills among USNS in the public Universities (Universities owned by Federal, State government and private owned Universities).
3. the extent to which the demographic factors predict possession of work skills among the USNS.

Research Questions

1. To what extent do University Senior Non-teaching Staff (USNS) possess work skills?
2. Is there any significant difference in possession of work skills, along school ownership, among University Senior Non-teaching staff?
3. What are the composite and relative contributions of the demographic

predictor variables (a) years of existence of University, (b) Age of staff, (c) Staff academic Qualification, (d) Staff years of experience and (e) School Ownership on University Senior Non-teaching Staff Work Skills?

Methodology

The study adopted descriptive research design of survey research type. The target population comprised all University Senior Non-teaching Staff (USNS) in both public and private Universities in Ogun State, Nigeria who are on CONTISS six (6) to twelve (12). Staffers on CONTISS thirteen (13) and above were excluded because many of them were Heads of Departments/Units that rated their subordinates. Stratified sampling technique was employed to select three (3) Universities from the State. The Universities were stratified by ownership. One University was randomly selected from each stratum (State and Private). Purposive sampling technique was used to select the only Federal

University in the State.

These Universities are:

- i) Federal University of Agriculture, Abeokuta
- ii) Tai Solarin University of Education
- iii) Crescent University

A total of three hundred and eighty-one (381) USNS were selected from the existing twelve (12) units in the Universities; Registry, Bursary, Information Communication Technology (ICT) Centre, Academic Planning Unit, University Health Services, Library, Works and Services, Sports Centre, Public Relations Unit, Internal Audit, Security and Technical and Technologists' Unit. The twelve (12) Heads of the Units were used to rate the selected staff in each University giving a total number of thirty-six (36) Heads of Units.

Simple random sampling was employed to select one hundred and eighty-two (182) from FUNAAB, one hundred and fifty-five (155) from TASUED and forty-four from Crescent University.

State	Institution	A		B		C		D		E		F		G		H		I		J		K		L		Total		
Ogun	Federal University	6	2	1	5	1	1	1	5	1	1	3		8	8	6		20	8	1	5	18	2					
	State University	5	7	1	2	8		1	2	9		2		8	6	4		20	6	1	1	15	5					
	Private University	1	0	3		2		4		3		2		4	2	2		6	3	3		4	4					
Total		3	12	9	3	0	2	1	3	1	2	3	7	2	0	1	6	1	2	46	1	7	2	9	38	1		

Keys

A = Registry

D = Health Centre/Services

G = ICT

J=Scientist/Technologists/Technical Unit

B = Bursary

E = Works and Services

H = Public Relations

K = Library

C = Internal Audit

F=Academic Planning

I = Sports

L = Security

Instrumentation

One instrument was used to collect data for this study - University Senior Non-teaching Staff Work Skills Scale (USNSWSS)

The scale was designed to rate the USNS. The head of each of the 12 Units that constitute the University Senior Non-teaching Staff in each of the selected Universities rated their subordinates. The scale was divided into two sections. Section A includes general information about the selected staff and the institution while section B consists of 39 items to assess Work skills of the USNS. The Work skills of the selected sample were rated on the scale which was simplified under some items on a five point

scale described under 1 = Very Poor, 2 = Poor, 3 = Good, 4 = Very Good and 5 = Excellent. The keys for appraising and scoring the staff on each item are as follows:

- 5 = Excellent:** Displays the work skills **consistently above acceptable levels;** Subordinate displays the skills at all times without exception
- 4 = Very Good:** Displays the work skills **occasionally below acceptable levels;** Subordinate displays the skills at high level with few exceptions;
- 3 = Good:** Displays the work skills to **merely meet acceptable levels;** Subordinate displays work skills to

- achieve desired expectation with errors, but such errors are corrected quickly
- 2 = **Poor:** Displays work skills occasionally below acceptable levels; Subordinate displays work skills but needs major improvement
- 1 = **Very Poor:** Displays work skills consistently below acceptable levels; Subordinate does not show work skills
- Cronbach alpha was used to determine the reliability and internal consistency of the scale which gave a reliability coefficient of 9.0. The heads of the Units in the Universities used the scale to assess their subordinates. Descriptive statistics, ANOVA and Partial Least Squares (PLS) were used to analyse the data collected.

Results

Research Question 1: Do University Senior Non-teaching Staff possess work skills?

Table 2: Mean (X) and Standard deviation (S) rating of USNS' possession of work skills

S/N	Item Statement	Mean (X)	Std. Deviation
Officer being assessed			
1.	is emotionally stable while working under pressure	3.85	.918
2.	defends organizational objectives	3.85	.862
3.	handles office tasks skillfully	3.88	.900
4.	is morally upright	3.97	.898
5.	has strong belief in what is right	3.91	.865
6.	Investigates issues appropriately	3.79	.864
7.	writes report clearly with little or no mistakes	3.72	.902
8.	is not disposed to cheating	4.02	.873
9.	is not disposed to stealing	3.95	.865
10.	tells the truth about an issue	3.98	.881
11.	follows up tasks to ensure appropriate delivery	3.81	.845
12.	is composed while facing any challenge	3.88	.897
13.	is always ready to get solution to every challenge he/she faces	3.86	.879
14.	takes appropriate action on problems as necessary	3.90	.805
15.	deals appropriately with sensitive matters	3.95	.840
16.	is not easily discouraged	3.86	.866
17.	tries his/her best to come through without delay	3.87	.822
18.	freely contributes his/her idea when there is need	3.90	.864
19.	controls himself/herself in terms of stress	3.83	.848
20.	has inclination to provide services with humility	3.87	.923
21.	handles documents appropriately	3.94	.929
22.	is firm in decision making	3.85	.852
23.	thinks about cases in an intelligent way	3.82	.831
24.	performs tasks sequentially	3.93	.864
25.	develops a feedback mechanism for self evaluation	3.80	.880
26.	lends himself/herself to corrections	3.88	.833
27.	possesses good representation of the institution in the public	3.86	.849
28.	accepts teachings that helps him/her to grow professionally	3.90	.875
29.	accepts positive changes	3.83	.886
30.	gives new idea of performing certain task	3.86	.874
31.	re-arranges office for a better and conducive environment	3.76	.818
32.	speedily recovers from set back	3.89	.815
33.	is confident	3.88	.829
34.	organises his/her time	3.93	.885
35.	uses his/her time constructively	3.93	.867
36.	receives compliment graciously	3.90	.802
37.	handles crisis tactically to get result	3.90	.846
38.	sticks to his/her plan	3.86	.896
39.	possesses different skills thereby useful in diverse ways	3.90	.903

*Group mean (x) = 3.87, Group SD = 0.885

Table 2 depicts the mean, group mean and the standard deviation of the extent to which the USNS possess work skills. The group mean value (3.87) is above 2.50 which is the agreed limit value.

Research Question 2: Is there any significant difference in the possession of work skills, among University Senior Non-teaching Staff, along school ownership?

Table 3: Summary of Descriptive analysis of mean pattern of the level of possession of work skills of USNS along School ownership

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Federal University	182	156.56	19.189	1.422	153.75	159.37	97	182
State Government	155	153.76	17.237	1.385	151.03	156.50	97	185
Private	43	158.56	18.787	2.865	152.78	164.34	117	188
Total	380	155.64	18.399	.944	153.79	157.50	97	188

Mean* = The transformed mean value to percentage for purpose of comparison

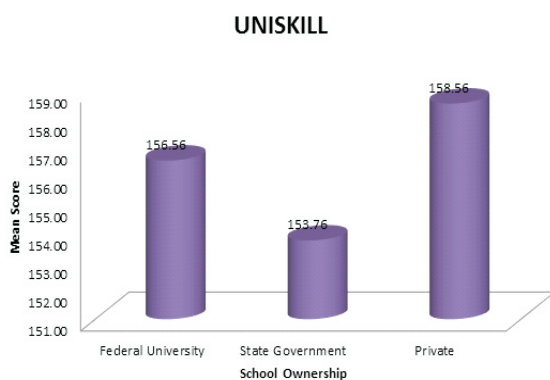


Fig. 1.1: Bar chart showing mean pattern of levels of possession of work skills among USNS along School Ownership

Table 4: Summary of the analysis of ANOVA on differences in the possession of work skills among the USNS along school ownership

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1067.432	2	533.716	1.58207	
Within Groups	127227.608	377	337.474		
Total	128295.039	379			

Table 3 shows the summary of analysis of mean pattern of possession of work skills among USNS along School ownership at the three

different categories, which are, Federal State and Private. The table shows a total mean of 155.64

The table reveals the mean of each category ($\bar{X}$ = 156.56), Federal ($\bar{X}$ = 153.76), State and ($\bar{X}$ = 158.56) Private. It shows that USNS in the Private University has the highest mean of 158.56 and the USNS in the State University has the lowest mean of 153.76

Figure 1.1 shows the Mean score of possession of work skills among the USNS in Federal, State and Private Universities 156.56, 153.76 and 158.56 respectively. This shows that USNS in the Private Universities possess the required work skills to be effective in the University system more than the USNS in the Federal and State Universities. However, the difference in possession of work skills along School Ownership is not significant at 0.207.

Research Question 3: What are the relative contributions of the predictor (demographic) variables; years of existence of University, Age of staff, Staff academic Qualification, Staff years of experience and School Ownership on University Senior Non-teaching Staff Work Skills?

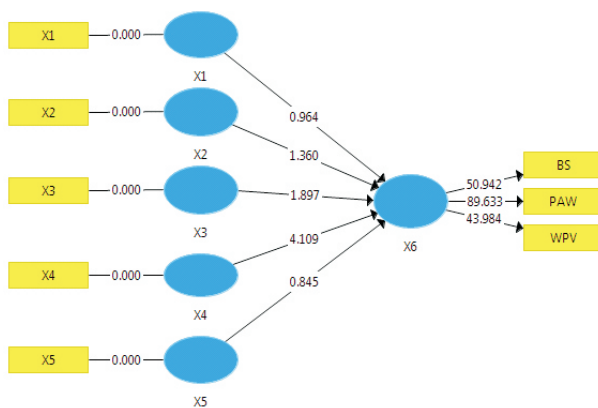


Figure 1.2 Structural Model with T values of the Demographic Variables and the Subscales of USNSWSS.

The path coefficients were later subjected to test of significance at 0.05 level of significance with two tails to determine the relative contribution of the demographic variables to work skill. The result of the analysis as displayed in Figure 4.3 revealed that only the path $X4 \rightarrow X6$ is significant on work skills, hence it is the only variable that has relative contribution to work skills. Table 4.14 presents the summary of the analysis. This result depicts that X4 has more influence on work skills with 0.247.

Table 5: Summary of the t Values and p Values of the demographic variables to the prediction of University Senior Non-teaching Staff Work Skills

	Path coefficient	Bootstrapped sample	t value	p Values
$X1 \rightarrow X6$	0.043	0.042	0.964	0.335
$X2 \rightarrow X6$	0.082	0.087	1.36	0.175
$X3 \rightarrow X6$	-0.105	-0.104	1.897	0.058
$X4 \rightarrow X6$	0.247	0.243	4.109	0.000
$X5 \rightarrow X6$	0.065	0.061	0.845	0.399

Based on the X6 variance, the 5 components model explains almost 80% of the variance in the predictors it shows that the model has adequate predictive ability. Each of the predictor variables has t and p values of 0.964; 0.335, 1.36; 0.175, 1.897; 0.058, 4.109; 0.000 and 0.845; 0.399 respectively. The table also reveals that only one predictor variable, staff highest academic qualification with t (4.109; 0.000) $p < 0.05$ predicts the possession of work skills

among the USNS. School ownership with t and p values 0.964; 0.335, age of University 1.36; 0.175, Staff age 1.897; 0.058 and staff years of experience 0.845; 0.399 contribute insignificantly to prediction of work skills among the University Non-teaching Staff.

Discussion

The findings of this study on possession of work skills along school ownership depicts that USNS possess the necessary work skills. However, the USNS in Private Schools possess the necessary work skills than staffers in the Public Schools which are owned by the Government (Federal and State). However, the difference is not significant. This finding did not corroborate the submission of Jimoh (2008) that the University Administrators are not effective. The null hypothesis was not rejected because there is no significant difference in the possession of work skills among the USNS, along school ownership. The mean margin was close and this could have been so because the Private institutions are goal oriented and take staff monitoring at the workplace as a priority. Due to this, Private Universities' staffers always show keen interest and put in their best in the tasks assigned to them. Also, this study revealed that the USNS possess the necessary work skills. This finding disagrees with Wachira (2016), who observed that non-teaching staff development in campuses faced challenges that are related to skill development that made them lack the necessary skills.

Therefore, it can be concluded that there was no significant difference in possession of work skills along school ownership among USNS. This finding may be unexpected because, staff in the Federal and State Universities were expected to possess work skills at a level that is higher than the staff in the private Universities due to years of existence of most of the Federal and State Universities. Besides, they have produced experienced staff who ought to have positively influenced the experience of the Senior Non-teaching Staff who are on grade level 6 to 12. This finding is in tandem with the findings of Arowojolu (2005) that parents patronised private primary schools due to effectiveness and efficiency of staff, constant and proper supervision or monitoring of staff performance

while parents noted the nonchalant attitude of staff, industrial strike actions, lack of facilities in the public schools.

From the above result, staff highest academic qualification contributes significantly in the prediction of University Senior Non-teaching Staff Work Skills. This contradicts the finding of Jimoh (2008) that academic qualification has no significant impact on the level of job performance among University administrators. Nevertheless, this finding corroborates Akorede and Olaniran (2012) assertion that teachers acquire higher qualifications because they always look for greener pasture as it has positive relationship with job performance. This study is also in support of Ashton *et al.* (2007), that qualification is one of the skills that is important in Britain. The finding of this study in respect of academic qualification is also in support of the work of Owolabi (2005) cited in Jimoh (2008). This finding corroborates the finding of Verhaest and Omeij (2009) and Owolabi and Adedayo (2012) which affirmed that qualification contributes to performance of employees. In similar vein, this finding supports the finding of Abdulrahmon, Adeleye and Tanimola (2018) who found that job performance of Bursary staff with professional qualification was higher than non-certified staff and Bursary staffers with higher tertiary education acquires better skills and performed better in accounting task than those with lower qualification.

From the table, other variables X1, X2, X3, and X5 may not have contributed to the prediction of possession of work skills among USNS due to globalisation and technology which had made education simple such that people can read and learn some of these skills. Again, the 21st century skills had become one of the important criteria used in recruiting employees. All these can be sourced for with the help of Information and Communication Technology (ICT).

Conclusion

This paper had attempted to explain what work skills are, the level of possession of work skills and the demographic factors that contribute to the possession of work skills among the University Senior Non-teaching Staff in Ogun

State. Education is an instrument that people can use to acquire and master some skills and techniques required to actively participate in the new global economy and to aid the employability of young ones. It is, therefore, very necessary that any developmental effort in Nigeria must recognize the need to widen the Human Resource (HR) base.

Recommendations

Also, since staff highest academic qualification significantly affects possession of necessary work skills, implementation of the staff development policy by the policy makers and the University Management should be revisited and strictly monitored. The University Senior Non-teaching Staff should be encouraged and supported financially to acquire higher degrees. The University Senior Non-teaching should also embrace this policy by showing positive attitude to additional qualification.

Therefore, Work Skills should be embedded in the school curriculum and students should be assessed like all other subjects at all levels of education by the Government.

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Student mathematics engagement: development and validation of a measurement instrument.

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Abstract

Engagement is an aspect of mathematics affective domain that previous studies had reported could influence learning of the subject. However, most of the tools available to measure this construct were validated using obsolete psychometric methods. This study therefore adopted a survey research design to develop Student Mathematics Engagement Scale (SMES). The sample consisted of four thousand, one hundred and forty-six (4,146) SS3 examinees from 73 schools randomly selected from co-educational public secondary schools in Oyo State, Nigeria. Data were analysed using Exploratory Factor Analysis (EFA), Horn Parallel Analysis (HPA), Confirmatory Factor Analysis (CFA) and Ordinal Alpha Reliability Coefficient. The results showed that the scale was reduced from thirty-three (33) to sixteen (16) items across three (3) components. Final compliance indices were: $\chi^2 = 658.99$, $p = 0.10$, RMSEA = 0.04, GFI = 0.98, AGFI = 0.97, TLI = 0.94, NFI = 0.94, SRMR = 0.01, CFI = 0.95 and IFI = 0.95. The ordinal alpha reliability index of the three (3) factors of SMES was 0.87, while the reliability index of each of the subscales of the SMES ranged from 0.76 to 0.87. Mathematics teachers at secondary schools should be encouraged to use the scale for measuring students' level of engagement in mathematics.

Keywords: *Student Mathematics Engagement Scale, Confirmatory Factor Analysis, Ordinal Alpha Estimation*

Introduction

Mathematics as a school subject has been a compulsory subject in the primary and secondary schools in Nigerian for many years and is a prerequisite subject for students aspiring to study science related courses and humanities in all Nigerian tertiary institutions. In spite of the important role of mathematics in the choice of career and daily living, the present level of achievement of students in mathematics at all levels of education calls for great concern. This is evident in the result of students in the West African Examinations Council for many years. The performance of secondary students in mathematics between 2005 and 2014 is an evidence that there was low level of achievement of Nigerian students in mathematics, since no year recorded 50% credit pass except 2008 throughout the period of ten years. If this problem is not addressed now, it may be difficult for Nigeria to position herself for national, sustainable development in science and technology that will ensure industrialisation by the year 2020. Madu (2011) stated that over

the years, the performance of students in mathematics at all levels of education has continued to decline geometrically judging from failure recorded in examinations and the number of students who enrolled for it. However, in spite of concerted efforts by the researchers to solve numerous problems affecting students' performance in the subject, the performance rate is still not improved.

It is very imperative for researchers in the area of mathematics education to intensify their researches and advance other reasons accountable for decline in students' level of performance in Mathematics. In other climes such as United Kingdom, United States of America, Germany etc there is a paradigm shift of research from government factor, parents factor, student factor, teachers factor and school related factors to student's engagement in Mathematics teaching and learning processes in and out of classroom. Perusal of literature has shown that an examinee features which has a very high likelihood of influencing learning

outcomes is known student academic engagement. This was classified into three along a continuum as observed by Fredricks, Blumenfield & Paris (2004) namely; cognitive academic engagement, behavioural academic engagement and emotional academic engagement. Academic engagement could be defined as the interest, the determination, and the passion of students towards learning and teaching. Therefore, academic engagement shows the relationship between non-cognitive factors such as attitude, interest, perseverance, and learning outcomes. It is predicated on the belief that when students are inquisitive, interested, determined, or motivated, learning improves. On the other hand, learning suffers when students are bored, uninterested, restless etc. Academic engagement is making every effort to learn what the teacher teaches. Educators view academic engagement differently. Some define it with reference to observable behaviours, while others define it in terms of internal state, with regard to observable behaviours, academic engagement is the willingness of students to participate in routine school activities such as attending classes, listening attentively, participating in classroom discussion (i.e. asking and responding to questions) and submitting assignments on time.

More so, it is the degree of attention, curiosity, interest, optimism, and passion that students show in learning as well as the level of motivation with which students learn and make academic progress. Furthermore, academic engagement refers to the extent to which students are connected to what is going on in their classes. Academic engagement according to Deneen (2010) manifests when students take on the academic challenge of directing learning, finding time to study and making effort to understand course content. When students are involved in active and collaborative learning (that is students working in pairs or small groups to discuss school work, there is evidence of academic engagement. Students also show signs of being engaged academically when they are into a cordial relationship with school staff that could help them improve their progress in school. Participating in enriching educational programmes that can complement school learning, such as independent study with use of

electronic device also augments learning. Academic engagement happens too when students maintain a healthy student-teacher relationship; such that there can be a follow up to what was taught in the classroom.

A careful review of literature shows that the construct (academic engagement) is multidimensional in nature and it is an indispensable variable that can influence students' achievement in mathematics. It is very important to understand the construct in-depth. To investigate this construct (student's academic engagement), it is desirable to develop valid and reliable instrument that can be used by the researchers and classroom teachers to observe students in their Mathematics classes and to ascertain any relationships between their levels of engagement and their academic performance in the class. Researchers such as Squire (2009); Deneen (2010) have developed different instruments in the time past to measure academic engagement without using robust statistical tools to establish the psychometric properties of the scale. Therefore, in this study, authors directed energy in the development and validation of measurement instrument for students' mathematics engagement.

Statement of the Problem

Mathematics is a school subject that is compulsory both at the primary and secondary school levels. It is also a pre-requisite for admission for students who aspire to study Science related courses and Humanities in all tertiary institutions. Researchers have been challenged to find ways of improving performance of students in mathematics because the current state of performance is declining. Thus, despite their immeasurable efforts, the performance was not improved. More importantly, researchers in the area of mathematics education should beam their searchlight on other reasons accountable for decline in students' level of performance. In advanced countries, researchers had shifted their attention from government factor, parents factor, student factor, teachers factor and school related factors to student's academic engagement in and out of the classroom. It is very essential to develop valid and reliable instrument that can be used by researchers and

classroom teachers to observe students during their Mathematics lessons. Though, literature remarked that researchers had developed and validated instruments over the years using obsolete psychometric methods. This will inherently affect the psychometric properties of the scale adversely. Therefore, in this study, authors directed energy in the development and validation of measurement instrument for students' mathematics engagement using robust statistical tools to establish the psychometric properties of the scale.

Research Questions

Three research questions guided the study. These include:

1. How many dimensions underlie Student Mathematics Engagement Scale (SMES)?
2. Are the fit indices explaining the model of SMES?
3. How reliable are the subscales of SMES?

Methods

Expost-facto research type of non-experimental design was used for the study. The population for the study consisted of Senior Secondary School three (SSS3) students of co-educational private, federal and public schools in Oyo State, Nigeria. Oyo State was stratified along the existing three (3) senatorial districts while purposive sampling method was used to select one (1) rural local government area (LGA) and three (3) urban LGAs was drawn randomly, making four (4) LGAs selected from each district. Six schools were selected randomly from each L.G.A, totalling 72 schools. An intact class of science, social-science and humanities of SSS3 were used from each of the selected school, making 4,146 testees. Among the 4,146 sampled participants, 2817 (67.9%) were males and 1329 (32.1%) were females. More importantly, when using maximum likelihood estimation as suggested by Jackson (2003) cited in Kline (2005) that sample size minimum requirement for any Structural Equation Modelling (SEM) family is the proportion of cases (N) to the number of model parameters

that require statistical estimates (q). An ideal sample size to parameters ratio would be 20:1. Thus, minimum sample size for this study should be $20 \times 33 = 660$.

The authors constructed the instrument used, called Student Mathematics Engagement Scale (SMES). The scale consisted of forty (40) draft items and after review by the expert in scale development. The scale was reduced to thirty-three (33) items with 3-point Likert scale where 3= Always, 2= Sometimes, 1= Never. Scores on negative items were reversed before the analysis. Missing data was established using expectation maximization (EM) method of single imputation technique with Little's missing completely at random (MCAR) test: Chi-Square = 8056.295, df = 6808, Sig. = .000. Since the p-value was significant, this implies that the proportion of missing data is ignorable since it does not exceed 5%. Data was analysed using Exploratory Factor Analysis (EFA), Horn Parallel Analysis (HPA), Confirmatory Factor Analysis (CFA) and Ordinal Alpha Reliability Coefficient.

Data Analysis

Data analyses were performed to determine the reliability and structural validity of SMES. Exploratory factor analysis (EFA), Horn parallel analysis (HPA), confirmatory factor analysis (CFA) and Ordinal alpha reliability coefficient were performed to ascertain the structural validity of the scale. R- programming version 3.4.0 was used for EFA in order to see interaction between the scale items and their components. The independent model Chi-square analysis was conducted using maximum likelihood estimates which depicts that variables contained in the study were correlated and fit for further analysis. Principal axis factoring extraction method with oblimin rotation were used to establish components structure of the scale, and horn parallel analysis was further conducted to verify actual number of scale dimensions. AMOS 23.0 package program was used to establish CFA, and substantiate the appropriateness of the model that was built in the EFA. However, in order to assess the stability of this model, values of chi-square ($\chi^2 = 1$), Probability level ($p = 0.05$), degree of freedom (df = 1), Tucker-Lewis index (TLI = 0.95), adjusted goodness of fit

index ($AGFI \approx 1$), goodness of fit index ($GFI < 0.95$), Normed fit index ($NFI = 0.95$), incremental fit index ($IFI = 0.90$) comparative fit index ($CFI = 0.90$), Root mean square residual ($SRMR = 0.08$) and root-mean-square error of approximation ($RMSEA = 0.06$) were determined (Kline, 2005). Consequently, twenty-six (26) items conclusively formed SMES. Furthermore, internal consistency of the scale and subscales were established using ordinal alpha reliability coefficient.

Results

Research Question One: How many dimensions underlie Student Mathematics Engagement Scale (SMES)?

Exploratory factor analysis using R was carried out on the examinees' responses to the scale items in order to determine structural validity and number of factors underlie the scale. Items less than 0.30 were suppressed totalling the number of items used in the study to be sixteen (16) out of thirty-three (33). The results of the independence model Chi-square analysis using the maximum likelihood estimates indicates that chi-square test statistic was statistically significant ($\chi^2 = 486.72$, $df = 75$, $p < 0.05$). This depicts that items in the study are correlated and the source data perfectly fits the number of factors specified. Principal axis factoring extraction with oblimin rotation segment of EFA conducted, depicts existence of four factors underlying the scale items. Meanwhile, horn parallel analysis was used to verify the number of factors identified from EFA and this revealed three factors is sufficient for the remaining 16 items. Figure 1.1 and 1.2 presents the parallel analysis scree plot and factor analysis, while Tables 1.3 and 1.4 present horn parallel analysis and factor loading of items that are above the cutoff point of 0.30 respectively.

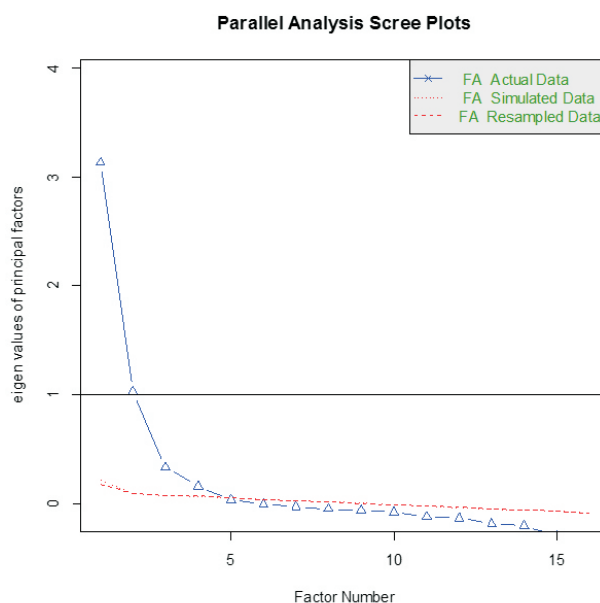


Figure 1.1: Scree Plot Parallel Analysis for Student Mathematics Engagement Scale (SMES)

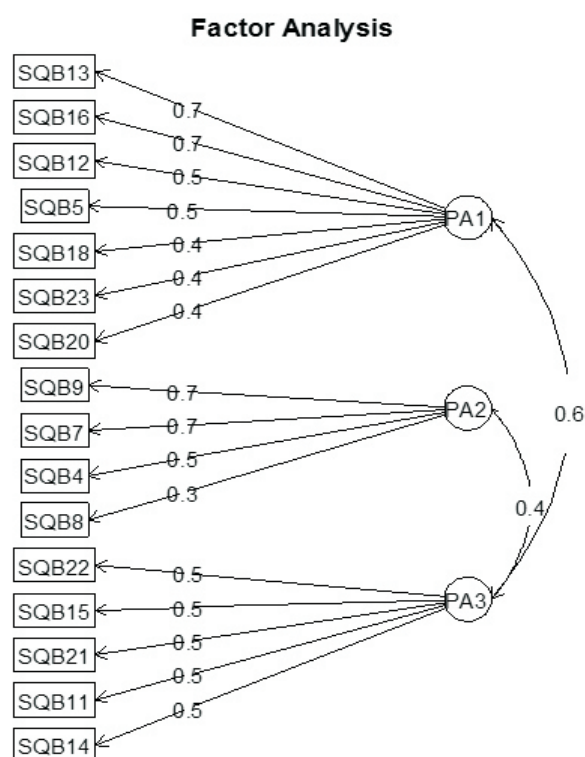


Figure 1.2: Subscales Analysis for Student Mathematics Engagement Scale (SMES)

Table 1.3: Presents Horn's Parallel Analysis for component retention

Factors	Adjusted Eigenvalue	Unadjusted Eigenvalue	Estimated Bias
1	3.81	3.92	0.11
2	1.77	1.85	0.09
3	1.09	1.16	0.07

Table1.4: Presents Factor Loading of the Scale Items

Item Code	Item	PA1	PA2	PA3	u2	h2
SQB4	I prefer sitting at the back of the classroom so that my mathematics teacher will not ask me questions		0.55		0.32	0.68
SQB5	I like to engage in mathematics exercises with my friends during my free period in the school	0.45			0.25	0.75
SQB7	I prefer to postpone my assignment in mathematics until it becomes late		0.68		0.47	0.53
SQB8	When I have any wrong answers in my mathematics assignments, I prefer to do my corrections		0.31		0.20	0.80
SQB9	I don't like to do any mathematics assignment		0.70		0.47	0.53
SQB11	When my score is poor in mathematics, I work harder for better performance			0.46	0.30	0.70
SQB12	I try to practise ahead of mathematics class so as not to miss out during mathematics lesson	0.53			0.33	0.67
SQB13	I like to practise mathematics exercises immediately after the class	0.70			0.45	0.55
SQB14	I work towards getting high marks in mathematics			0.46	0.32	0.68
SQB15	I do my best to gain understanding of the topic I am taught in mathematics			0.47	0.31	0.69
SQB16	I use my free periods in school to practice the topics I'm taught during mathematics lesson	0.67			0.42	0.58
SQB18	I like working out complex mathematics problems	0.44			0.21	0.79
SQB20	I ask my teacher for clarification on mathematics exercises that I find somehow difficult	0.38			0.24	0.76
Item Code	Item	PA1	PA2	PA3	u2	h2
SQB21	When I have difficulties with my mathematics assignment, I ask fellow students around me to help me out			0.46	0.18	0.82
SQB22	I keep company of friends who can assist me in mathematics topics			0.49	0.20	0.80
SQB23	I practise exercises from other mathematics textbooks apart from the recommended text	0.38			0.26	0.74
Sum Square (SS) loadings		2.08	1.53	1.30	4.91	
% Variance		31.00	23.00	13.00	67.00	

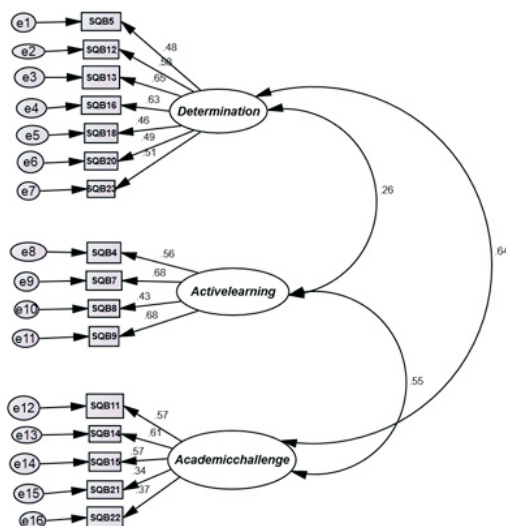
*Extraction Method: Principal Axis Factoring.

*Rotation Method: Oblimin.

Table 1.4 depicts that 16 Items contained in the SMES loaded across three dimensions. The first dimension consists of seven (7) indicators (SQB5, SQB12, SQB13, SQB16, SQB18, SQB20, SQB23) measuring a construct called “*DETERMINATION*”. The second consists of four (4) indicators (SQB4, SQB7, SQB8, SQB9) measuring a construct called “*ACTIVE LEARNING*”. And the third consists of five (5) indicators (SQB11, SQB14, SQB15, SQB21, SQB22) measuring a construct called “*ACADEMIC CHALLENGE*”. Perusal of EFA revealed that first-factor loading ranges between 0.38 and 0.70 explaining 31.0% of the total variance, the loading values of the second factor ranges between 0.31 and 0.70 explaining 23.0% of the total variance and the third factor loading values ranges between 0.46 and 0.49 explaining 13.0% of the total variance. In all, 67.0% of the total variance jointly explained the three dimensions. Also, column 6 gave value for uniqueness (u2). These values are secondary information and shows the percentage of the statistical variance for each original item that isn't explained by the factors. A large uniqueness value indicates that none of the latent factors captures a variable well, so smaller values are better. More so, column 7 gave value for communality (h2). Values here described percentage of each variable's variance that can be explained by the factors.

Research Question 2: Are the fit indices explaining the model of SMES?

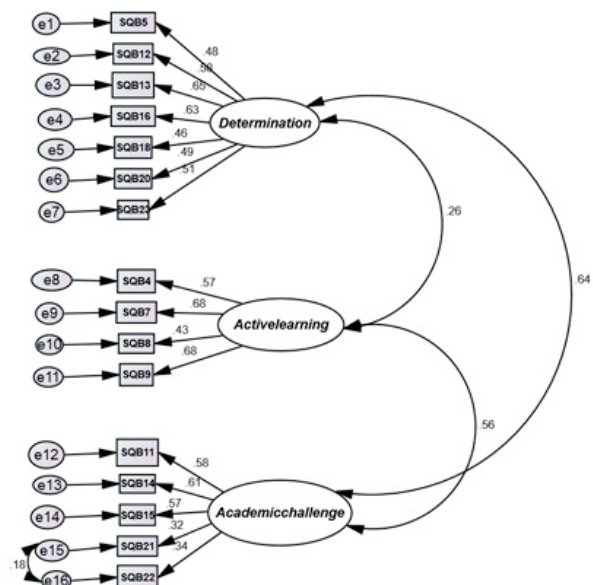
Confirmatory factor analysis (CFA) implemented in AMOS was used to further test result obtained from EFA. Figure 2.1 presents the outline factor distributions and loading values for the CFA.



Chi-square = 782.165, df = 101, p-value = 0.000, RMSEA = 0.070

Figure 2.1: Factor distribution and CFA values

It can be observed from Figure 2.1 that correlation coefficient values between the components and related items varied between 0.34 and 0.68. The first factor and the second factor covariance was 0.26, covariance between the first factor and the third factor was 0.64 and the covariance between the second factor and the third factor was 0.55. These values show that the items in the scale are appropriate to represent the hypothesised structure. In addition, the chi-square, degree of freedom and compliance index values of this model were calculated as follows: $\chi^2 = 782.17$, $p = 0.00$, RMSEA = 0.07, SRMR = 0.01, GFI = 0.97, AGFI = 0.96, TLI = 0.92, NFI = 0.93, CFI = 0.94 and IFI = 0.94. Examining index values obtained from the above model (figure 2.1), it can be concluded that the proposed model is not in agreement with the observed data. More importantly, modification indices need to be assessed to know which of the items with error of variance had outlier values so, as to release them from the model. Therefore, this was done to some of the items in order to take into account the level of relationship between item errors and the hypothesised model. The relationship between items 21 and 22 were released. After these corrections, the model in Figure 2.2 was obtained as follows



Chi-square = 658.994, df = 101, p-value = 0.010, RMSEA = 0.037

Figure 2.2: CFA values after items modification

Appraisal of figure 2.2 depicts that model obtained after items modification was in congruent to the observed data. Thus, the final compliance index values obtained were as follows: $\chi^2 = 658.994$, $p = 0.010$, RMSEA = 0.037, SRMR = 0.013, GFI = 0.981, AGFI = 0.974, TLI = 0.941, NFI = 0.943, CFI = 0.951 and IFI = 0.951. Furthermore, when the covariance between the factors was assessed, the first factor had 0.26 relationship with the second factor, the relationship between the first factor and the third factor was 0.64 and the relationship between the second factor and the third factor was 0.56.

Research Question 3: How reliable are the sub-scales of SMES?

Ordinal reliability in R-programming was used to establish ordinal alpha reliability coefficient of SMES. Though Cronbach's alpha (Cronbach, 1951) remains the most widely used method of estimate reliability index, it is still characterized by many shortcomings as observed by Cronbach (2004). The lacuna between the two methods is that ordinal alpha is based on the polychoric correlation matrix, compared to Cronbach alpha which is based on Pearson covariance matrix (Gadermann, Guhn & Zumbo, 2012). Thus, ordinal alpha estimates more accurately for measurements containing ordinal data like the current study. The ordinal alpha coefficient for the scale items was 0.87, and the first sub-scale was 0.82, the second sub-scale was 0.80, and the third sub-scale was 0.76. Based on the alpha values for the three sub-scales, it can be concluded that both the scale and sub-scales were very reliable and valid.

Discussions

One of the cardinal segments in the domain of learning is called affective. This domain is an important area (such as academic engagement); mathematics teachers need to pay careful attention to. It is very imperative to develop scale for measuring academic engagement precisely. The results of exploratory factor analysis and parallel analysis for structural validity shows evidence of three dimensions underlying the scale. About 67% of the total variance accounted for the observed three-factors scale. Also, confirmatory factor analysis was conducted to test earlier result gotten from EFA. Thus, review of EFA and CFA analyses brings to the conclusion that the three factors scale is tenable and valid. Nevertheless, ordinal

alpha reliability coefficient displayed high degree of reliability of SMES consisting of 16 items and their sub-scales. Results from structural validity and reliability of the SMES can be used by the mathematics teachers in secondary schools to measure examinees' level of engagement in the subject.

Conclusion and Recommendations

Results from structural validity and reliability of the SMES can be used by the mathematics teachers in secondary schools to measure examinees' level of engagement in the subject. Also, it can be recommended that teachers should be encouraged to use the scale to measure examinees level of mathematics engagement.

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Estimating the psychometric properties of 50 multiple choice mathematics item for senior secondary II students in Ikwerre Local Government area of Rivers State using classical test theory.

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Abstract

Test development for assessment is an art that needs accurate estimation of item difficulty, discrimination and chance factor. This study was on estimating psychometric properties of 50 items multiple choice test item in mathematics. Three research questions were stated to guide the findings of the study. The population comprised all senior secondary II students in Ikwerre Local Government Area. Simple random sampling technique was used to select the sample of the study. A total of 900 SS II students were used for the study. A self-constructed multiple choice test in mathematics made up of 50 items was constructed from SSCE Mathematics syllabus, using a table of specification. The reliability of the instrument was determined using Kuder – Richardson formula 20 (KR20) and the reliability coefficient was 0.79. The test was administered to the selected sample and the psychometric properties estimated using Classical Test Theory. Results showed that thirty-five items were to be retained while fifteen items were discarded based on estimate of difficulty index. Two items have high positive discrimination, seventeen items have moderate positive discrimination, while sixteen items are on borderline positive discrimination and fourteen items had zero discrimination and one item has a negative discrimination. The distracter index is forty-two items on negative distracter, thirty items on positive distracter and eight items on zero distracter. Based on these recommendations were made including that test developers should be trained and know how to apply the formula effectively

Keywords: *Difficulty, Discrimination, Distracter and Multiple Choice Questions.*

Introduction

Mathematics is a tool that everybody uses daily to solve practical and abstract problems. It deals with logical reasoning and quantitative calculations. At a basic level, everybody needs to count, multiply, subtract and divide. Mathematics makes it possible for people to count days, weeks, months and years. Every area of mathematics has its own unique applications to the different career options. Thus, Mathematics is one of the compulsory subjects for primary and secondary school learners (Federal Republic of Nigeria. National Policy on Education 2004). Therefore, the minimum requirement to gain admission into most Nigerian universities include at least a credit in each of Mathematics and English language and three other relevant subjects. Over the years, students' Mathematics performance in external examinations has been low. For example, from 2006 to 2015, the percentage of students who passed Mathematics at credit level and above (A1 to C6) in May/June West African Secondary School Certificate Examination was as low as

40.3 5% in 2011 and as high as 63.15% in 2014. Similarly, a review of the National Examinations Council Senior School Certificate Examination results from 2007 to 2016 reveals that the percentage of students who had credit and above in Mathematics, during the period, were as low as 25.62% in 2010 and as high as 80.76% in 2015. Consequently, many candidates were denied admission into tertiary institutions because of their low Mathematics performance.

Nigerian Educational Research and Development Council (NERDC) (2012) rightly observed, "Poor performance and failure in Mathematics are real in our secondary schools when globally considered". This situation is very disturbing when viewed against the nation's aspirations for scientific and technological advancement. This perennial decline has remained a source of concern to science educators, Mathematicians and Mathematics educators (Nnaka & Anaekwe, 2004). According to Afolabi (2010), the quality of a nation's education determines the quality of

the product of its education system and by extension, the quality and quantity, pace and level of its development. This is probably why every nation tends to invest more in getting her populace educated.

Efforts have been made towards improving performance in Mathematics within the country. The Mathematical Association of Nigeria (MAN) and Science Teachers Association of Nigeria (STAN) collaborated to produce Mathematics textbooks accompanied with students' workbooks to aid teaching and learning of Mathematics in both junior and senior secondary schools. The National Mathematics Centre (NMC) in its attempt to revamp Mathematics teaching and learning in Nigerian secondary schools, initiated the Mathematics Improvement Programme (MIP) project. The MIP project was designed to introduce new teaching methods to enhance students' performance in Mathematics.

Despite all these efforts and the importance accorded to Mathematics as one of the core science subjects and as a compulsory subject to be passed at credit level before admission into tertiary institutions, some students still consider Mathematics as a “monster” while others see teachers of mathematics as “monsters”. Issues like the teaching method used by mathematics teachers, much talk about mathematics being the most difficult subject etc, sometimes give rise to misconception, fear, phobia, anxiety and “I cannot do it syndrome” among mathematics students. These issues have exerted a great impact on students' academic achievement in mathematics examination.

NERDC (2012) had also asserted that Psychometric properties of examinations are the internal and/or external attributes inherent in tests upon which an assessment of candidates is based. These properties include the facility and difficulty indices, the discrimination index, the power of distracters, validity and reliability indices. In a mathematics examination the examinees are required to choose one response among set of many alternatives.

A multiple choice item question comprises of a stem, a key and distracters. The stem is the direct

question or incomplete statement while the key and the distracters are collectively known as alternatives or options. The key is the correct answer to an item within the alternatives while the distracters are the remaining alternatives that are not the answer (Opara2016). Student's performance is very important to a teacher because it is used to measure outcome. Ukwuije and Opara (2012) suggested that maximum performance measurement is to obtain what a person can do under ideal condition that is determining a person's abilities. Here the testing condition is carefully controlled and the student is told to do his best. A quality testing is a panacea to the issues of measurement, assessment and evaluation; as they provide enough evidence to accurately make decision and improve educational practice and efficiency.

Testing procedures and tools should be reliable within the framework of a test theory or model of application. Testing procedures determines the credibility of the scores provided by items and the validity aids in estimating the abilities of the examinees.

Test developers are concerned about the quality of test items and how examinees respond to them. Writing test items needs a lot of precision. A test item must focus the attention of the examinee on the principle or construct upon which the item is based. Ideally, students who answer a test item incorrectly will do so because their mastery of the principle or construct in focus was inadequate or incomplete. Any characteristics of a test item which distract the examinee from the major point or focus of the item, reduces the effectiveness of that item. Any item answered correctly or incorrectly because of extraneous factor in the item, results in misleading feedback to both the examinee and examiner.

Thus, items in a given test are characterized by (i) discrimination index (a), (ii) difficulty index (b), (iii) distracter index (c). Item difficulty, otherwise known as item facility, is the proportion of examinees who answer a particular item correctly, the item difficulty is an indication of the extent to which an item is difficult to the respondents. An item difficulty

level is determined by estimating the percentage of examinees that get the item right when it is administered. The higher the difficulty index, the easier the item. The lower the index, the more difficulty the item. Discrimination index, closely related to difficulty index, is item discriminative index. Kpolovie (2010) argued that discriminative index is the extent to which an item accurately differentiates between the best-able and least-able examinees on the entire items that constitute the test. Some items may be found to exhibit negative indices. In this case, the item tends to penalize more of the strong examinees than the weak ones. This is an abnormal behaviour, thus such an item should be re-assessed. The discriminating index is the best rough measure of the extent to which an item discriminates between examinees who earn high scores on the whole test and those who do not. It is thus a measure of whether a given item contributes towards the general direction of the other items of the test. This is, however, based on the assumption that most of the items are contributing significantly towards the efficacy of the test to discriminate between strong and weak examinees. The effectiveness of distracters, an item with an incredible incorrect alternative should not be taken to form the final test. An incredible distracter is that which is so transparently wrong, incorrect or unattractive that virtually none of the examinees ticking the incorrect alternatives opted for it. A test constructor should endeavour to determine how effective the distracter is in attracting responses. An effective distracter is one that distracts those respondents who are not sure of the correct answer. A distracter should thus be effective in reducing guess work.

OBJECTIVE

The objective of this study is to find the psychometric properties of a 50 itemed student's performance in mathematics via estimates of difficulty, discrimination and distracter indexes.

Research Questions

The following research questions were slated to guide the findings of this study.

1. Which items estimate properly the difficulty index on student's performance in Mathematics?
2. Which items discriminate on student's performance in Mathematics?
3. Which items distracter on student's performance in Mathematics?

METHODOLOGY

Instrumentation research design was used for the study, it involves the development and estimation of difficulty, discrimination and distracter indexes of research instrument in Mathematics.

Multi stage sampling procedure was adopted for the study. Simple random sampling technique was then used to select eight schools out of fourteen schools. Stratified random sampling was also used to draw 900 SS2 Students from the population of 1312 SS2 Students to whom were administered the 50 item instrument. The instrument used for the study was Mathematics Achievement Test (MAT). The MAT was validated by three experts in measurement and evaluation and two subject specialists. The reliability of the instrument was determined using Kuder-Richardson formula 20 (KR20) and the reliability coefficient was 0.79. The student's performance (scores) arranged from upper to lower scores and graded as 31 – 50 upper group and 1 – 30 as lower group. 25% of the multiple choice answer papers were randomly selected from upper and lower group respectively which consist of 36 scripts to estimate the difficulty, discrimination and distracter indexes. Based on the estimation formula, items would be satisfied fit at 0.3 to 0.6, using manual method.

Results.

Research Question 1. Which items estimate properly the difficulty index on student's performance in Mathematics?

S/no.	Upper	Lower	Total	Difficulty Index
1.	12	18	36	0.83
2.	11	4	36	0.41
3.	11	1	36	0.33
4.	14	6	36	0.56
5.	11	5	36	0.44
6.	13	8	36	0.58
7.	13	11	36	0.67
8	9	1	36	0.28
9	12	4	36	0.44
10	15	5	36	0.56
11	17	16	36	0.92
12	9	8	36	0.47
13	10	4	36	0.39
14	7	1	36	0.22
15	12	7	36	0.53
16	14	15	36	0.81
17	13	4	36	0.47
18	16	14	36	0.83
19	16	15	36	0.86
20	13	8	36	0.58
21	18	15	36	0.91
22	10	3	36	0.36
23	8	3	36	0.30
24	8	1	36	0.25
25	17	13	36	0.83
26	10	7	36	0.47
27	14	7	36	0.58
28	16	12	36	0.78
29	15	7	36	0.61
30	14	9	36	0.64
31	11	1	36	0.33
32	16	16	36	0.89
33	15	18	36	0.91
34	16	15	36	0.86
35	15	11	36	0.72
36	16	14	36	0.83
37	9	6	36	0.42
38	16	14	36	0.83
39	13	9	36	0.61
40	15	8	36	0.64
41	15	8	36	0.64
42	18	15	36	0.92
43	15	14	36	0.81
44	16	17	36	0.92
45	17	17	36	0.94
46	17	17	36	0.94
47	17	17	36	0.94
48	17	10	36	0.75
49	17	9	36	0.72
50.	16	10	36	0.72

Table 1b. Difficulty index (B) distribution of items of student's performance in Mathematics.

Items	Items
1,4,6,7,10,11,15,16,18,19,20,21,25,27,28,29,30,32,33,34,35,36,37,39,40,41,42,43,44,45,46,47,48,49,50	2,3,5,8,9,12,13,14,17,22,23,24,26,31,38.
35 items retained	15 items poor/not retained.

From the above table, it was observed that 35 items were retained, 18 items not retained from the 50 item students' performance in Mathematics.

Research Question 2. Which items discriminate on student's performance in Mathematics?

Table 2.

S/no.	Upper	Lower	Total	Discriminatory Index
1	12	18	18	1.67
2	11	4	18	0.83
3	11	1	18	0.67
4	14	6	18	1.11
5	11	5	18	0.89
6	13	8	18	1.17
7	13	1	18	1.33
8	9	1	18	0.55
9	12	4	18	0.89
10	15	5	18	1.11
11	17	16	18	1.83
12	9	8	18	0.94
13	10	4	18	0.78
14	7	1	18	0.44
15	12	7	18	1.05
16	14	15	18	1.61
17	13	4	18	0.94
18	16	14	18	1.67
19	16	15	18	1.72
20	13	8	18	1.17

21	18	15	18	1.83
22	10	3	18	0.72
23	8	3	18	0.61
24	8	1	18	0.5
25	17	13	18	1.67
26	10	7	18	0.94
27	14	7	18	1.16
28	6	12	18	1.55
29	15	7	18	1.22
30	14	9	18	1.17
31	11	1	18	0.67
32	16	16	18	2
33	15	18	18	1.83
34	16	15	18	2
35	15	11	18	1.44
36	16	14	18	1.44
37	9	6	18	1.67
38	16	14	18	0.83
39	13	9	18	1.67
40	15	8	18	1.22
41	15	8	18	1.27
42	18	15	18	1.83
43	15	14	18	1.61
44	16	17	18	1.83
45	17	17	18	1.89
46	17	17	18	1.89
47	17	17	18	1.89
48	17	10	18	1.5
49	17	9	18	1.44
50	16	10	18	1.44

Table 2b. Discrimination power (A) of the items on students' performance in Mathematics.

Items on high positive discrimination 2.00 and above	Items on moderate positive discrimination 1.50-1.99	Items on border line positive discrimination 1.00-1.49	Items on low to zero positive discrimination 0.50-1.00	Items on negative discrimination 0.00-0.49
2	17	16	14	1

The table above shows that 2 items are on high positive discrimination, 17 items are on moderate positive discrimination, 16 items are on borderline positive discrimination, 14 items are on low to zero positive discrimination and 1 item is on negative discrimination.

Research question 3. Which items distracter on student's performance in Mathematics

TABLE 3a: Estimation of distracter index (c) with 50 multiple choice item of five options ABCDE in student's performance in Mathematics.

ITEM	A			B			C			D			E			TOTAL
	H	L	DI	H	L	DI	H	L	DI	H	L	DI	H	L	DI	
2	2	0.00		5	1	0.22	*	*	*				1	1	0.00	18
							*	*	*	2	3	-0.11				18
1	1	0.00		2	2	0.00	*	*	*							18
*	*	*		2	1	0.11				0	4	-0.22				18
0	1	-0.11		*	*	*	1	3	-0.22	0	1	-0.11				18
0	2	-0.22		2	0	0.22	1	0	0.11	*	*	*				18
				1	1	0.00				0	3	-0.33	*	*	*	18
2	4	-0.22		2	0	0.22	*	*	*	0	1	-0.11				18
3	2	0.11		0	1	-0.11				0	1	-0.11	*	*	*	18
0	1	-0.11		0	2	-0.22	*	*	*	2	1	0.11				18
0	1	-0.11		1	3	-0.22				*	*	*	0	2	-0.22	18
				*	*	*	0	1	-0.11				1	3	-0.22	18
0	2	-0.22		1	0	0.11	0	1	-0.11	*	*	*	1	3	-0.22	18
1	3	-0.22		*	*	*	0	2	-0.22							18
*	*	*					0	2	-0.22				5	2	0.33	18
0	3	-0.33					1	0	0.11	*	*	*				18
0	2	-0.22					*	*	*				1	1	0.00	18

*	*		0	1	-0.11	0	2	-0.22				1	0	0.11	18
			2	2	0.00	1	2	-0.11	*	*	*				18
0	1	-0.11	1	4	-0.33	*	*	*	0	1	-0.11				18
1	0	0.11	*	*	*	1	1	0.00	0	2	-0.22				18
0	1	0.11	1	2	-0.11										18
1	1	0.00	1	1	0.00	6	4	0.22				*	*	*	18
0	2	-0.22	2	2	0.00	*	*	*				0	1	-0.11	18
						1	3	-0.22	4	2	0.22	*	*	*	18
*	*	*	1	1	0.00	0	1	-0.11	5	3	0.22	3	4	-0.11	18
6	3	0.33	*	*	*							1	0	0.11	18
0	2	-0.22	*	*	*	5	2	0.33	3	0	0.33				18
*	*	*	0	1	-0.11	0									18
0	1	-0.11				2	3	-0.11	*	*	*				18
0	3	-0.33	6	2	0.44	1	2	-0.11	*	*	*	1	0	0.11	18
5	2	0.33	*	*	*							0	2	-0.22	18
6	2	0.44	0	1	-0.11	0	4	-0.44	*	*	*	1	0	0.11	18
*	*	*	1	3	-0.22							4	2	0.22	18
4	4	0.00	0	1	-0.11	1	1	0.00	*	*	*				18
*	*	*	9	8	0.11										18
*	*	*	2	0	0.22	2	1	0.11							18
			3	3	0.00	0	1	-0.11	*	*	*	1	0	0.11	18
0	2	-0.22				0	1	-0.11				*	*	*	18
0	2	-0.22	0	1	-0.11	*	*	*				0	1	-0.11	18
5	0	0.55	*	*	*							0	1	-0.11	18
									*	*	*				18
			1	0	0.11	*	*	*	0	1	-0.11				18
*	*	*	1	2	-0.11										18
0	1	-0.11	0	1	-0.11							*	*	*	18
0	1	-0.11	0	3	-0.33	*	*	*							18
			2	2	0.00				*	*	*	0	1	-0.11	18
			*	*	*				1	1	0.00				18
0	2	-0.22	0	1	-0.11	3	0	0.33				*	*	*	18
*	*	*	2	1	0.11	0	2	-0.22				0	1	-0.11	18

TABLE 3b: Distracter Index (C) of the Items of Students Performance in Mathematics

Negative distracter item	Positive distracter item	Zero distracter item
2d, 4a, 5a,c,d, 6a, 7d, 8a, d, 9b, d, 10a,b, 11a, b, e, 12c, e, 13a, c, e, 14a, b, 15c, 16a, 17a, 18b, c, 19c, 20a,b, d, 21d, 22b, 24a, e, 25c, 26c, e, 28a, 29b, 30a, c, 31a, c, 32e, 33b, c, 34b, 35b, 38c, 39a, c, 40a, b, e, 41e, 43d, 44b, 45a, b, 46a, b, 47e, 49a, b, 50c, e	1b, 4b, 6b, c, 7b, 8b, 9a, 10a, 13b, 15e, 16c, 17e, 18e, 19b, 21a, c, 22a, 23c, 25d, 26d, 27a, e, 28c, d, 31b, e, 32a, 33a, e, 34e, 36b, 37b, c, 38b, e, 41a, 43b, 49c, 50b	1A, E, 3a, b, 23a, b, 24b, 26b, 35a, c, 47b, 48d

The table above shows that 42 items are not effective distracter, 30 items are effective distracter and 8 items has equal distracter.

DISCUSSION

For 50 item Mathematics student's performance, the difficulty index ranges from 0.08 of item 31 to 0.50 of item 42. 35 items were to be retained for the final testing whereas 15 items are poor/not retained. These items should be discarded. This agrees with Toland (2008) that the accuracy of student's error of estimate of b parameter under 3pl depends on the amplitude of the parameter being estimated.

The estimate of the discrimination index shows that it ranges from 0.00 of items 25, 26, 33, 34, 38, 42, 43, 48, 49 to 0.33 of items 41; 41 items have moderate positive discrimination; 7 items are borderline positive discrimination and 8 items had negative discrimination. All other items belong to low to zero discrimination. The negative discrimination revealed that lower ability students perform better on items 1, 6, 24, 27, 28, 31, 32, and 37 than the higher ability students. The items belonging to low to zero discrimination shows that equal number of higher ability and lower ability students answer the items correctly. The indication is that the items on negative discrimination direction does not discriminate, therefore be discarded (Opara 2016).

The distracter index ranges from 0.00 to 0.40 from the result presented. 42 items are on negative distracter, 30 items on positive distracter and 8 items on zero distracter. The indication reveals that negative distracter attracts higher ability students than low ability students. It further shows that the distracter is

not effective. Positive distracter attracts low ability students than higher ability students showing effective distracter. The zero distracter items attracts both the higher ability students and low ability students. It is thus, equally distracted. The relationship between the psychometric properties and its associated estimate could be attributed to factors described by Toland (2008) as test length, underlying ability or other factors. In summary, 35 items were retained based on the consideration of the difficulty index estimation.

CONCLUSION

The findings from the study shows that 35 items from the 50 itemed multiple choice questions on student's performance in Mathematics were considered as having their difficulty index lying within the acceptable limit. It also observed that the estimate depends purely on the psychometric properties. There is a strong relationship between the item defaulting and the trait of estimate item information provided by the difficulty and discrimination index of items.

The estimation of distracter index is determined by the number of item distracter retaining or rejecting an item as a function of the interaction of all the items of the test. Some of the items require a review, to constitute a fairly good item for a final test.

RECOMMENDATIONS

The following recommendations were made

1. That examination bodies should store verified psychometric properties test items in

their computer base bank for sale to users.

2. Test developers should be well trained in the art of estimating difficulty, discrimination and distracter indexes procedure for credible, valid and reliable test item construction.

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Stress as correlate to academic performance of student midwives in school of midwifery, St Philomena Catholic Hospital, Benin City, Edo State.

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Abstract

This study investigated stress as correlate to academic performance of student midwives in School of Midwifery, St. Philomena Catholic Hospital, Benin City, Edo State. Stress is a general experience in the lives of every individual irrespective of race or cultural affinity. Student midwives are prone to stress because of their different responsibilities: Although a lot of researches have been carried out on the variables that determine the academic proficiency of student midwives but it seems stress in relation to student midwives' academic performance have not received much attention in research context. The study used cross-sectional descriptive survey research type of ex-post facto design; two hundred (200) student midwives were drawn through convenient sampling procedure from St. Philomena, School of Midwifery, Benin City. Stress Knowledge and Management Questionnaire ($r = .682$) was used to gather information in this study. Five hypotheses were stated and tested. The data obtained were analysed using correlation and multiple regression analysis at 0.05 level of significance. There was significant negative association between student's level of study and knowledge of stress ($r = -0.144, p < 0.05$). Also, the result reveals that religion was not significant on stress coping Mechanism ($r = .035, p > 0.05$). In addition, the finding shows that student's level of study was not significant on experienced of stress ($r = .014, p > 0.05$). Similarly, the finding reveals that age was not significant on coping mechanism of Stress ($r = -.020, p > 0.05$). The multiple correlation coefficients (R) of all the combined independent variables with academic performance of student midwives was 0.290. This implies that there is 29% association among level of stress knowledge, stress experience, coping mechanism and academic performance of student midwives. R square = .084. The adjusted R square which estimates the variance on dependent variable measure accounted for by the combination of independent variables is 0.070. This implies that, all the independent variables: (level of stress knowledge, stress experience and coping mechanism) made 7% contribution to the variance in academic performance of student midwives. The researcher submitted that the student midwives should develop effective stress coping mechanism to avoid poor academic performance.

Key words: Stress, Coping-mechanism, Knowledge of stress, Academic-performance.

Introduction

Stress is a general occurrence. People from different background experience stress.

There are different areas where an individual can experience stress; parenting, secular job demands resulting from heavy workload, stress as a result of drill and training which may affect an individual positively or otherwise to mention but a few. Critical explanation of the word stress is significant, since, it provides a clue on how individuals react to everyday vicissitudes.

Stress is a procedure through which the individual perceives and copes with different

perplexity. Webster (2006) asserted that stress is a state that is normally depicted by signs of mental and physical nervousness, as downheartedness which may be as a result of reaction to condition an individual perceives endangered. Empirical studies carried out to investigate causes of academic related strain of midwife students discovered that clinical rotations shift, deficiency of rest, and nature of supervisor who oversees the academic commitment of the students as well as individual stress coping level determine the effect of stress (Kuhn, et al., 2005) cited in Watson, Yanhua, Smith, Wong, and Deary (2013).

On the issue of stress, Aluja and Blanch (2004) discovered that stress encountered by student midwives in clinical training increase as they advance in the programme. Similarly the result corroborates Stecker (2004) who asserts that nursing learners obtained higher academic and exterior stress than learners in physical therapy, pharmacy, dentistry and medicine. Angel and Huan (2006) claim that stress experience varied based on the study level. That fresh student midwives were predisposed to heavy strain in contrast to other study level. This may be as a result of the transition from home to take up a new tasking responsibility.

Similarly, Baker (2003) discovered that the student midwives experience many interpersonal, social and academic challenges in the period of their transition for training in midwifery. Baldwin (2000) is of the opinion that majority of the student midwives take the challenge of making decisions out their career, identifying those to associate with and new realities that change their former orientation as well as missing family ties thus forming major stressors for them. Baker (2003) further posited that the ability of student midwives to manage the period of transition and technically handle their strain determine their progress in their academics and choice of career and academic. Gurung (2005) was of the opinion that the only antidotes for stress during period of transition into midwifery training, is social succor from different relations that cushion the negative effects of stress.

According to Kuh (2000) the source of stress for student midwives is feasibility of meeting up with the assignment time limit. However, Kyoshaba (2009) discovered that student midwives perceived that course work load in the first year is a major stressor and that substantial association exists between course work load and examination strain as well as anxiety (Kyoshaba, 2009).

Again, Lumleg and Provenzan (2009) discovered that everyday routine are the major stressor among student midwives. Davonport and Lane (2006). Bang and Zeidner (2000) asserted that there is association between

relational difficult and many other strain, indicating that the more relational challenges an individual has, the more the magnitude of stress such will experience. Stecker (2004) discovered that students midwives who are working alongside training may likely experience more strain than their counterparts that are running the programme on full time basis.

Baldwin and Bradley (2009) accentuated that on the job, learners experience large strain during end of semester and final qualifying examinations compared to other periods during the academic programme cycle. This emanated from non-appearance in the lesson as a result of work requirement. Stress in academic is acknowledged to have numerous discouraging consequences on academic as well as students' well-being. Academic strain is perceived to hamper students' physical life, thinking procedure and familiarization conduct Baldwin (2000). The academic strain experienced by most learners is attached to non-productive study practice, such as inefficient study time administration (Atibuni, 2012). However, Abidgnit and Ahamad (2006), Abouserie (1994) and Crede and Kuncle (2008) Rayle and Cung (2008), and Surridge (2008) found that productive stress coping mechanism such as spiritual exercise was discovered to be a solution to stem stress in academic. (Baldwin, 2000). Similarly, Smith and Renk (2007) asserted that long years of training is the stressor among student midwives

Early researchers such as (Jimenez, Navia-Osorio, and Diaz, 2009; Garrett, 2011; Watson, Yanhua, Smith, Wong, and Deary, 2013) asserted that stress symptoms are: headache, ulcers and high blood pressure, anxiety, low self-respect and anger.

It is a rampant complaint among student midwives, that the workload often causes them frequent headache, insomnia and fatigue which inhibit their study habit and has a flow of influence on the students' achievement. Although a lot of empirical investigations have been carried out on the variables that determine the academic proficiency of students midwives but seem stress in relation to their academic performance had not received much attention in research context. All these problems that are

faced by student midwives in School of Midwifery, St. Philomena, Benin City propelled the researcher to embark on investigation of stress as correlate to academic performance of student midwives in School of Midwifery, ST. Philomena Catholic Hospital, Benin City, Edo State.

Hypotheses

Consequent to the problem identified in this study, the following hypotheses were stated and tested.

1. There is no significant relationship between the student's level of study and their level of knowledge of stress.
2. There is no significant relationship between the student's level of study and the experienced of stress.
3. There is no significant relationship between religion and coping mechanism of stress.
4. There is no significant relationship between age of the students and coping mechanisms.
5. There is no significant composite and relative contribution of stress indices (level of stress knowledge, stress experience and coping mechanism) to academic performance of student midwives.

Methodology

The Design: The study adopted an ex-post facto design of cross-sectional descriptive survey research type. This research type was chosen because the researcher does not have control over the variables as their manipulation had already occurred.

Population: The target population of this study is the students of St. Philomena Catholic Hospital, School of Midwifery, from year 2, year 3 and final year. The population comprises of four hundred (400) female students undergoing Midwifery training.

Sample: Simple random sampling procedure was employed to select two hundred students out of the total population of four hundred (400) students of St. Philomena, School of Midwifery, Benin City. The selected two hundred (200) students was calculated using Yaro Yemane

statistical method.

$$n = \frac{N}{1 + N (e^2)}$$

Where N = Total Population

n = Sample size

e = 0.05

$$n = \frac{400}{1 + 400 (0.05^2)}$$

$$n = \frac{400}{1 + 400 \times 0.025}$$

$$n = \frac{400}{1 + 1.0025}$$

$$n = \frac{400}{2 + 0.0025}$$

$$n = \frac{400}{2.0025}$$

$$n = 200$$

is the required

N = Sample size is the total

N = Sample population

E = Error of tolerance (0.05)

Instrumentation: The data for this study was collected by means of self-structured questionnaire designed by the researcher and was given to the experts in research instrument construction for face validity. The questionnaire comprises of five *sections*, from section A-E. Section A: Demographic data of the participants, Section B: contains six items on knowledge of stress among student nurses, Section C: contains seven items on level of stress experienced by students, section D: contains seven items on coping mechanism used by mid-wives in school, Section E: contains five items on stress as

correlate of academic performance. The participants responded to the items in the questionnaire, using the following categories: Strongly Agree = SA, Agree = A, Disagree = D, Strongly Disagree = SD and No Stress =NS, Slight Stress =SS, Moderate Stress =MS, High Stress =HS.

Validity and Reliability of Instrument

Evidence of validity was achieved by giving a

copy of the instrument each to four medical experts for face validity, essential amendment and adjustment were made. It was further validated by the researcher on a similar sample of thirty (30) respondents that were not included in the study; the reliability; content and construct validity of this instrument was established using Cronbach Alpha and the resulting reliability co-efficient was 0.68.

Result

Table 4.0.1: Summary of Participants Bio-data by Age Bracket

Age Bracket	Frequency	Percent	Valid Percent	Cumulative Percent
12-16years	5	2.5	2.5	2.5
17-21years	99	49.5	49.5	52.0
22-26years	65	32.5	32.5	84.5
27years and above	31	15.5	15.5	100.0
Total	200	100.0	100.0	

Table 4.0.1 revealed the distribution of participants by their age bracket. It was discovered that the participants in age bracket 12 and 16 years were (3%). Similarly, the participants with age bracket 17 – 21 years were (49%). Besides, the participants with age bracket 22 – 26 years were (33%). Moreover, participants with age bracket 27 years and above were (16%). This implies that a larger percentage of the participants are mature enough to give information to the researcher and majority of them are between age 17 to 26years.

Table 4.0.2: Summary of Participants Bio-data by Gender

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	200	100.0	100.0	100.0

Table 4.02 revealed the distribution of the participants by their gender. It was observed that the entire participants were female, this may be as a result of the profession (Midwives) considered in this study.

Table 4.0.3: Summary of Participants Bio-data by Type of Study

Type of Study	Frequency	Percent	Valid Percent	Cumulative Percent
Basic	178	89.0	89.0	89.0
Post-basic	22	11.0	11.0	100.0
Total	200	100.0	100.0	

Table 4.0.3 revealed the distribution of the participants by their type of study. It was observed that participants in basic study type was 89% of the total participants as against 11% who are participants in post-basic study type.

Hypothesis One: There is no significant relationship between the student's level of study and their level of knowledge of stress.

Table 1: Correlation between Student's Level of Study and their Level of Knowledge of Stress

Variables	No	$\bar{x}$	SD	(r)	P	Remark
Student's Level of Study	200	2.97	0.96	-.144	< 0.05	Significant η^2
Level of Knowledge of Stress	200	19.23	2.58			

Significant at 0.05

Table 1 presents the Pearson product moment correlation result of the relationship between student's level of study and level of knowledge of stress. The table reveals negative low significant relationship between the variables at ($r = -0.144$, $p < 0.05$). This implies that student's level of study does not singly determine student midwives' knowledge of stress and the null

hypothesis one which stated that: There is no significant relationship between the student's level of study and their level of knowledge of stress was not rejected

Hypothesis Two: There is no significant relationship between the student's level of study and the experience of stress.

Table 2: Correlation between Student's Level of Study and Experience of Stress

Variables	No	$\bar{x}$	SD	(r)	P	Remark
Student's Level of Study	200	2.97	0.96	.014	> 0.05	Insignificant η^2
Experienced of Stress	200	14.37	4.22			

Significant at 0.05

Table 2 presents the Pearson product moment correlation result of the association between students' level of study and experienced of stress. The table reveals positive low insignificant relationship between the variables at ($r = .014$, $p > 0.05$). This implies that student's level of study does not singly determine the level of stress experienced among student midwives.

Therefore, the null hypothesis two which stated that: There is no significant relationship between the student's level of study and the experienced of stress was not rejected.

Hypothesis Three: There is no significant relationship between religion and coping mechanism of stress.

Table 3: Correlation between Religion and Coping Mechanism of Stress

Variables	No	$\bar{x}$	SD	(r)	P	Remark
Religion	200	1.04	0.19	.035	> 0.05	Significant η^2
Coping Mechanism of Stress	200	19.39	2.81			

Significant at 0.05

Table 3 presents the Pearson product moment correlation result of the association between religion and coping mechanism of stress. The table reveals positive low insignificant relationship between the variables at ($r = .035$, $p > 0.05$). This implies that student's religion does not singly determine the coping mechanism of

stress among student midwives. Therefore, the null hypothesis two which stated that: There is no significant relationship between religion and coping mechanism of stress was not rejected.

Hypothesis Four: There is no significant relationship between age of the students and coping mechanisms.

Table 4: Correlation between Age of the students and Coping Mechanism of Stress

Variables	No	(r)	P	Remark
Age	200	-.020	> 0.05	Significant
Coping Mechanism of Stress	200			

Significant at 0.05

Table 4 presents the Pearson product moment correlation result of the relationship between age and coping mechanism of stress. The table reveals positive low insignificant relationship between the variables at ($r = -.020$, $p > 0.05$). This implies that student's age does not singly determine the coping mechanism of stress among student midwives. Therefore, the null

hypothesis two which stated that: There is no significant relationship between age of the students and coping mechanisms was not rejected.

Hypothesis Five: There will be no significant composite and relative contributions of stress indices (level of stress knowledge, stress experience and coping mechanism) to academic performance of student midwives.

Table 5: Regression Summary and ANOVA of Level of Stress Knowledge, Stress Experience and Coping Mechanism and Academic Performance of Student Midwives

R = .290 R² = .084 Adj R² = .070 Standard Error = 2.042					
Analysis of Variance					
Source of Variance	Sum of Square	Df	Mean Square	F	Sig.
Regression	75.287	3	25.096	6.016	.001
Residual	817.588	196	4.171		
Total	892.875	199			

**** Significant @ $p < .05$; $n = 200$**

Table 5 shows that the multiple correlation coefficients (R) of all the combined independent variables with academic performance of student midwives was 0.290. This implies that there is 29% association among level of stress knowledge, stress experience, coping mechanism and academic performance of student midwives. R square = .084. The adjusted Rsquare which estimates the variance on dependent variable measure, accounted for by the combination of independent variables is

0.070. This implies that, all the independent variables: (level of stress knowledge, stress experience and coping mechanism) made 7% contribution to the variance in academic performance of student midwives. Regression ANOVA produced ($f_{(3, 196)} = 6.016$, $p < 0.05$). This indicates that a composite relationship of the entire predictor variables (level of stress knowledge, stress experience and coping mechanism) considered in this study to academic performance of student midwives is statistically significant.

Table 6: Relative Contribution of Level of Stress Knowledge, Stress Experience and coping Mechanism in the Prediction of Academic Performance of Student Midwives

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	8.728	1.771		4.929	.000
Level of Knowledge	.021	.059	.025	.348	.728
Stress Experience by Students	.030	.037	.060	.822	.412
Coping Mechanism	.027	.054	.276	3.872	.000

**** Significant @ $p < .05$; $n = 200$**

Table 6 shows the relative contribution of independent variables on criterion variable (academic performance of student midwives). The entire independent variables considered contributed significantly different to economics. These are, coping mechanism ($\beta = .276$, $t = 3.872$, $P < 0.05$), However, level of knowledge ($\beta = .025$, $t = 0.348$, $P > 0.05$) and stress experience by students ($\beta = 0.060$, $t = 0.822$, $P > 0.05$) did not contribute significantly to the prediction of academic performance of student midwives. The value of the standardized regression weight associated with the three variables shows that coping mechanism is the potent predictor of academic performance of student midwives. This implies that only one out of the three independent variables considered in this study is the major predictor of academic performance of student midwives.

Discussion of Findings

The finding from the study reveals that a significant negative association exists between student's level of study and level of knowledge of stress among student midwives. The finding is in consonance with many authors and researcher assertions on the influence of stress. For instance, Oermann (2008) discovered that stress encountered by student midwives in clinical training advanced as they step forward in the programme. Similarly the result corroborate Steckle (2004) who asserted that nursing learners obtained desirable achievement academically and exterior strain than learners in other medical field. Lumleg and Provenzan (2009) asserted that stress experience varied base on the study level. That fresh student midwives were predisposed to heavy strain in contrast to other study level. This may be as result of the transition from home to take up a new tasking responsibility. The result also support Baker, (2003) who discovered that the midwives students experience many interpersonal, social and academic challenges in the period of their transition for midwives training. Lumleg and Provenzan (2009) were of the opinion that majority of the midwives students are being challenge on making decision on their career, likewise, identification of those to associate with and privy to new hints that change their former orientation as well as

missing family tie. Baker in addition posited that the ability of midwives students to manage the period of transition and technically handle their strain determine their progress in their choice of career and academic pursuits. Gurung (2005) was of the opinion that the only antidotes for stress during period of transition into midwives training, is social succor from different relations that cushion the negative effects of stress.

Similarly, the finding from this study shows insignificant association between students' study level and experienced of strain among student midwives. Kuh (2000) asserted that the source of stress for midwives student is feasibility of meeting up with the assignment time limit. However, Kyoshaba (2009) discovered that student midwives perceived that course work load in the first year is a major stressor and that there is a significant association between course work load and examination stress and anxiety (Kyoshaba, 2009).

Resulting from the assertion of earlier researchers, Webster (2006) asserted that stress is a state normally depicted by sign of mental and physical nervousness, as well as downheartedness which may be as a result of reaction to condition an individual perceives endangered. Empirical studies carried out to investigate causes of academic related strain of students midwives discovered that clinical rotations shift, deficiency of rest, and nature of supervisor who is overseeing the academic commitment of the students as well as individual coping level determine the effect of stress (Kuhn, et al. 2005) cited in Watson, Yanhua, Smith, Wong, and Deary, (2013).

The finding shows no significant association between age and stress coping mechanism of student midwives. Nevertheless, Lumleg and Provenzan (2009) discovered that everyday routine are the major stressor among midwives student. Davonport and Lane (2006); Bang and Zeidner (2000) claimed that there is association between relational difficult and many other strain, indicating that the more relational challenges an individual has, the more the magnitude of stress such will experience. Stecker (2004) discovered that students midwives who are working alongside training

may likely experience more strain than their counterpart that are running the programme on full time basis.

Baldwin and Bradley (2009) accentuated that on the job, learners experience large strain during end of semester and final qualifying examinations compare to other period during the academic programme cycle. Stress in the academic environment is acknowledged to have numerous discouraging consequences on academic performance as well as students' well-being. Academic strain is perceived to hamper students' physical life, thinking procedure and familiarization conduct (Baldwin, 2000). The academic strain experienced by most learners is attached to non-productive study practice, such as inefficient study time administration (Atibuni, 2012).

The finding from this study shows that association exist between religion and productive stress coping mechanism among student midwives. However, Abidgnit and Ahamad (2006), Abouserie (1994) and Crede and Kuncle (2008), Rayle and Cung (2008), Surridge (2008) found that productive stress coping mechanism such as spiritual exercise was discovered to be a solution to stem stress in academic (Baldwin, 2000). Similarly, Smith and Renk (2007) asserted that long year of training is the stressor among student midwives.

Conclusion and Recommendations

The paper investigated stress as correlate to academic performance of student midwives in School of Midwifery, St. Philomena Catholic Hospital, Benin City, Edo State. Since there are positive significant composite relationship among stress indices (level of stress knowledge, stress experience and coping mechanism) and academic performance of student midwives when the school administrators put in place various cushion devices that will reduce stress for the student midwives, there is tendency that academic performance of student midwives will increase. Therefore, the students should develop effective stress coping mechanism to avoid poor academic performance; the midwifery school administrators should endeavour to put in place various cushioning devices that will reduce stress for the student midwives; the students

should schedule their daily activities to avoid stress.

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Application of generalizability theory in estimation of variance components in National Examination Council essay questions in English Language

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Abstract

Application of generalizability theory in estimation of variance components in National Examination Council Questions in English language. Design is two facet fully crossed G – study and D – study. The population 723 senior secondary schools in Ikwerre Local Government Area. Simple random sampling technique via balloting to draw six schools out of fourteen senior secondary schools. Cluster sampling technique to sample 153 students. Instrument is 2018 November/ December National Examination Council English Language Essay Questions. Data obtained analysed using computer software SPSS through General Linear Model via variance components MINQUE method. Result the largest contribution to error is person by item by rater ($\hat{\sigma}_{pir}$) (5.259) with percentage variance of 47: 221 and person by item ($\hat{\sigma}_{pi}$) (4.253) percentage variance of 38.17; person by rater ($\hat{\sigma}_{pr}$) (0.415) percentage variance of 3.72, person ($\hat{\sigma}_p$) (0.398) percentage variance 3.57%, rater ($\hat{\sigma}_r$) (0.80) percentage variance 7.18, item ($\hat{\sigma}_i$) (0.024) percentage variance 0.21, item by rater ($\hat{\sigma}_{ir}$) (1-0.008) percentage variance -0.071. The universe score 5.5368, Relative error variance 5.1146, Absolute Error Variance 0.4222, G- study coefficient 0.5198 and Index of dependability 0.929 obtained. Recommendation, generalizability theory should be used in psychometric properties estimate to generate reliable test items.*

Key word Essay, Variance, Estimation, Generalizability theory.

Introduction

English Language is a core subject in Primary and Secondary Schools in Nigeria Educational Environment. It is language of communications in both school and non-school settings, English Language has to be learnt in schools because of the role it plays in the educational system and the society. The teaching and learning of English Language must not be taken for granted, it should be carefully and thoroughly studied. Adegbile (2002; 2003) clearly stated that success at every level of educational system depends largely on competence in English. Certificate awarded to candidates that pass the examination set by National Examination Council could be used to obtain employment and again the minimal requirement for admission into any tertiary institution of higher learning in Nigeria points at credit grade in English Language. The senior secondary school certificate examinations conducted by National Examination Council have shown that many students fail ridiculously in English Language papers. Issues that bother the teachers, the public, parents and other stakeholders is mass

failure rate which they blame on the National Examination Council as it concern construction, validation, and administration of examination conducted by them that lack adequate psychometric analysis of its items; this research is needful based on public complain and perception on the recorded mass failure, hence development of a measuring instrument that accurately measures a particular characteristics of the examinee in the best perfect manner without any unsystematic or systematic error both in the instrument and characteristics under investigation is bound to pose problems to the examinee. It is only when the instrument measures in perfect manner that such unquestionable quantitative descriptions of the examinee in terms of the exact extent to which it possess and demonstrate the trait can be adjudge for the best in relation to decisions to be subsequently taken for reliable oral, essay and objective item in English Language. Hence this investigation seek to validate essay question.

Essay Questions is one of the assessment tools in testing or assessing student's achievement in any

given instruction. Essay tests measure the higher levels of cognitive domain which provide critical thinking and originality in students. Linn, Miller and Gronlund (2005) stated that essay items provide the freedom of response that is needed to adequately assess the ability of students to formulate problems, organise, integrate and evaluate ideas and information and thus, apply knowledge and skills. Orluwene (2012) defined Essay test as the type of test item which allows the students the freedom to supply their own responses, rather than select the correct answer. She further stated essay tests are presented with a narrative or question form, and the students are required to compose a reply which presents a complete response in at least one sentence; since the item allows for task with larger scopes, by requiring students to organize and integrate information, interpret information, give arguments, give explanations, evaluate the merit and demerit of ideas, and conduct other types of reasoning that tap complex thinking. In this study, the researcher will make efforts to avoid the use of options in English Language essay questions because it is the assessment of levels of all the sampled population to estimating variance components in National Examination Council English Language Essay Questions.

Generalizability (G) theory is a statistical theory about the dependability of behavioural measurement, Cronbach, Gleser, Nanda, and Rajaratnam (1972) states the notion of dependability as follows: The score (on a test or other measures) on which the decision is to be based is only one many scores that might serve the same purpose. The decision maker is almost never interested in the response given to the particular stimulus objects or questions, to the particular tester, at the particular moment of testing. Some, at least, of these conditions of measurement could be altered without making the score any less acceptable to the decision maker... The ideal data on which to base the decision would be something like Person's mean score over all acceptable observations. (p.15). Kin and Wilson(2009) refers dependability of behavioural measures as the accuracy of generalizing from a person's observed score on a measure, or a test to the score that the person who have received average over all possible

conditions. This type of variation that is mainly due to the measuring instrument rather than factors which are directly controlled by the examinee denotes uncertainty in the quantitative description of the individual on the basis of the test. The unsystematic error or fluctuation in the individual's scores over several repeated testing's mean that in the behavioural sciences, one cannot completely depend on the single score obtained by each student on an attribute that was measured once. According to Shavelson and Webb(1991) dependability refers to the accuracy of generalizing from a person's observed score on a test or other measure (behaviour observation, opinion survey) to the average score that person would have received under all the possible conditions that the test user would be equally willing to accept. This notion of dependability is the assumption that the person's knowledge, attitude, skill, or other measured attribute is in a steady state; it is assume that any differences among scores earned by an individual on different occasions of measurement are due to one or more sources of error, and not to systematic changes in the individual due to maturation or learning. Orluwene (2012) indicated that, in the measurement of complex traits imperfect instruments are used so that the score observed for each person almost always differs from person's true ability or characteristics; she further affirmed that the discrepancies between the true ability and the observed ability results from measurement error, which implies some inaccuracy in the measurement exist because measurement error may inflate or depress any subject's score in an unpredictable or predictable manner. To satisfactorily control the whole issue raise above on the problem of incomplete certainty in and dependence on a score obtained by an individual from a single administration of a test for accurate quantitative description of the person with respect to a given psycho- social construct, the researcher is required to empirically establish the reliability of the measuring instrument which he or she develops. The comparism of dependability of reliability in generalizability theory and classical test theory to determining standard error measurement varies. Atilla(2012) asserted that the use of classical test theory approaches to determining score reliability, however, are not capable of

identifying and untangling this profusion of error which classical reliability was not conceptualized to do since it account for only one source of error at a time. Similarly, Ikeh and Madu cited Tavako and Brennan (2013) states Classical Test Theory (CTT), assume the student's true score is the sum of the student's observed score and a single undifferentiated error term. Kpolovie (2010) asserted classical theory as reliability embedded in the true- score and error- score model defines reliability as the coefficient that predictable proportion of variance in observed scores from the true scores. Generalizability Theory liberalizes classical theory by employing ANOVA methods that allows an investigator to untangle multiple sources of error that contribute to the undifferentiated E in classical test theory. But is important to state that GENOVA, SAS, SPSS and Edu-G program are computer software used for statistical analysis, data mining and predictive analysis. In this study SPSS computer program via General Linear Model on Variance Components (MINQUE) method was fully adopted for the estimation of variance components for generalizability theory. Generalizability Theory is a statistical theory for estimating the reliability of behavioural measurements which offers researchers an opportunity to asses comprehensively sources of measurement error (variance components). G- Theory concerns itself about the relative and absolute dependability of behavioural measures. The empirical works that support this investigation includes, Atilla (2015) estimation of generalizability coefficient: application with different programs, Ikeh and Madu (2018) applications of generalizability theory in estimating multiple sources of variation in economics essay test, Heitman, Kovaleski and Pugh (2009) Application of generalizability theory in estimating the reliability of Ankle-Complex Laxity Measurement and Preuss (2003) Using generalizability theory to Develop Clinical Assessment Protocols. Items – crossed – with raters in the universe of admissible observations. This means that any one of the N_i items might be rated by one of the N_r raters. If the population is crossed with this universe of admissible observation, then the corresponding G-study design is $p \times i \times r$, in which the responses of N_p persons by N_i items are each

evaluated by N_r raters (Brennan 2001). Therefore, estimation of variance components for this fully crossed design can be used to estimate results for any possible two facet design. The theory of generalizability focuses on the magnitude of sampling out errors due to person, item, rater and occasions among others, then their interactions which provides estimates of the magnitude of measurement error in the variance components as well provide a summary dependability coefficient reflecting the generalizing a sample score or profile to the much larger domain of interest (Shavelson, Baxter and Gao, 1993).

This study seems to thoroughly investigate person by item by rater variance of measurement error in the context of cognitive domain based test in National Examination Council Essay questions in English Language. Johnson, Dulanay and Banks (2002) asserted measurement error is a situation in which students true ability is either underestimated or overestimated. Hence, the need of estimating measurement error is inevitable because the inconsistencies that exist in measurements instruments is enormous especially variance components.

Aim

The aim of this study is to estimate the variance components of persons by items by raters and scores dependability on National Examination Council Essay Questions in English Language with the application of generalizability theory.

Research Question:

1. What are the relative contribution of person, item, rater and their interactions?
2. What is the dependability coefficient reliability of the instrument?

Methods

The design is instrumentation with two – facet fully crossed G – Study and D- Study. D- Study generalizability theory uses the information obtained from G-Study to determine the measurement procedure in minimizing undesirable variance and maximize dependability reliability.

The population are made up of all Senior

Secondary School Three Students in Ikwerre Local Government Area of Rivers State, Nigeria. Simple random sampling technique via balloting used to draw six schools out of fourteen senior secondary schools. Cluster sampling technique used to sample 153 SS3 Students from the population of 723 SS3 Students and was administered the National Examination Council Essay Question (continuous writing section) in English Language.

Instrument for data collection – 2018 November/December National Examination

Council Essay Question in English Language mostly continuous writing which contains four items (Question), each item is rated on 10 points marking scheme which was adapted by the raters.

The data collected was analysed using a computer software SPSS through General linear model under Variance components MINQUE method.

Results

Estimate of Variances component on Generalized Linear model under variance components (MINQUE METHOD)

Source	Type 1 sum of variances	Df	Mean. Square	Variance component	% variance
Person	2829.114	152	18.613	0.398	3.57
Item	159.800	3	19.933	0.024	0.21
Rater	54.805	1	54.805	0.80	7.18
Person * Item	6277.075	456	13.766	4.253	38.17
Item * Rater	11.937	3	3.979	-0.008*	-0.071
Person * Rater	1051.820	152	6.920	0.415	3.72
Person * Item* Rater	2397.938	456	5.259	5.259	47.221
Error	000	0		.000	
(Residual)					
Total	12682.489	1223		11.141	100

components (MINQUE METHOD)

Table 1: The result presented the estimated variance components and its interactions. The result shows that the largest contribution to measurement error is person by item by rater (σ^2_{pir}) (5.259) with percentage variance of 47: 221 and it is followed by person by item (σ^2_{pi}) (4.253) percentage variance of 38.17; person by rater (σ^2_{pr}) (0.415) percentage variance of 3.72,

person (σ^2_p) (0.398) percentage variance 3.57%, rater (σ^2_r) (0.80) percentage variance 7.18, item (σ^2_i) (0.024) percentage variance 0.21, item by rater (σ^2_{ir}) (-0.008*) percentage variance - 0.071. The estimation of various component interacted very high among person, item and rater (σ^2_{pir}).

Estimation of G and D reliability coefficient

Relative Error variance	Absolute Error variance	Universe score	G-Study Coefficient	Index of Dependability
5.1146	0.4222	5.5368	0.5198	0.929

Table 2: The result shows estimation of G and D study reliability coefficient where.

The universe score 5.5368, Relative error variance 5.1146, Absolute Error Variance 0.4222, G- study, coefficient 0.5198 and Index of dependability 0.929, were obtained from the scores.

Discussion

The result revealed that the largest contribution to measurement error from the score obtained is on the person, item and rater σ^2_{pir} (5.259, 47.221%) the result indicated that a proportion of the variance was due to the interaction of person by item by rater (σ^2_{pir}). However, this large variance component observed is not only in relation to persons, items and raters but also to undifferentiated error. The second largest source of variance is person by item σ^2_{pi} (4.253, 38.17%) Third, person by rater σ^2_{pr} (0.415, 3.72%) relative to variation due to person σ^2_p (0.398, 3.57%) followed by rater σ^2_r (0.80, 7.18%) then item σ^2_i (0.024, 0.21%) The item by rater σ^2_{ir} variance component has (-0.008*, -0.071%) indicating that error due to item by rater yielded negative estimate (-0.008), as a result of the degree of freedom for the residual (Error) amounted to zero. However the concern with variance component estimation is when a negative estimate arises because of sampling error or model misspecification, the possible solution is to set negative estimate to zero but use of negative estimates in expected mean square equations for other components (Brennan 2001).

Interestingly, the estimation of the G and D study of generalizability theory was achieved by using the universe score. A generalizability coefficient is the ratio of universe score variance to itself plus relative error variance, and Index of dependability is the ratio of universe score variance to itself plus absolute error variance (Brennan 2001). The universe score is 5.5368 on itself plus relative error variance estimate G. study coefficient 0.5198. Again the universe score of 5.5368 on itself plus Absolute Error variance estimate Index of dependability 0.929. Therefore, the reliability coefficient of the instrument is 0.93, which is high and adequate

for certificate examination.

Conclusion

Based on the results of the generalizability analysis, the largest contribution of variance components obtained is from person by item by rater, followed by person by item, rater, person by rater, person, item. While item by rater indicated a negative estimate as a result of the degree of freedom for the residual which amounted to zero. Hitherto, the Index of dependability is high and reliable as much the instrument is good to use for certificate examination.

Recommendation

This study is basically to reduce the influence variance components that arise from scores by students in any examination. Generalizability Theory/analysis should be used to subject students' scores for psychometric properties estimate in order to generate reliable test item for examination bodies

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Assessment of Gender-related Differential Item Functioning of Teacher-Made Chemistry test.

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Abstract

A good item that will measure the intended domain is expected to be free of biases. But several studies have confirmed that some items in a test reveal biases due to a group of testees.. A generally acceptable analytical technique that can be used to discover biases in test items is the Differential Item Functioning (DIF) which Item Response Theory (IRT) offers to check differences in psychometric properties due to the groups that testees belong. Thus, this study used the DIF technique to detect gender biased items in a teacher made Chemistry test. BILOG-MG was employed using 350 (183 males and 167 females) students from 10 Senior secondary school Two (SSII), randomly drawn from Obio/Akpor Local Government Area of Port Harcourt, River State, Nigeria. The study showed that out of one hundred items, fifty-three items were biased. However, 26(49.1%) out of 53 were in favour of the female while 27(50.9%) were in favour of the male which confirmed biases. DIF is effective in detecting group biases of test items. The study concluded that Differential Item Functioning should always be used by scale developers before collating the final items for a test.

Key words: *Item Response Theory, BILOG MG, Differential Item Functioning*

INTRODUCTION

Educational measurement and evaluation is a vital approach to ascertaining the desired outcome in learners. It is a way of providing tangible proof that the set objectives are achieved. It is used to ascertain the presence of an attribute or trait in a learner or a group of testees and the extent to which these traits are manifested and being able to pass a value judgment on the learner or group of testees. Banta (2000) said that outcome assessment helps teacher to know the knowledge level of students as a result of underlined instructions of the course module. The data obtained from the assessment can be used as a guide to know how successful a student has mastered the expected set module. This will also assist faculty to improve various aspects of the learning process such as instruction, course content and curricular structure. The information will help the institution to have a strong position about the credibility of a course module in producing competent and marketable graduates. Studies have been carried out on subjects areas such as physics, mathematics, biology, which are the core science subjects. Whereas, not many of such has been done on chemistry. It then

becomes imperative to measure and evaluate students' capabilities and outcome performances in Chemistry as a subject.

Nworgu (2011) defined test as an instrument that consists of a set of uniform questions or tasks that a testee or a group of testees will attend to independently. The result of which can be used to provide a reliable on-comparison of different testees' performance. The most practical tool through which the extent of knowledge and skill acquisition is determined at each stage of education is in the form of examination. It is well planned and strategized in order to evaluate, assess and test knowledge and skills. An examination can also be defined as a way of ensuring what a candidate has mastered in a subject matter in a certain field of study (Maduka, 1993). Homby (1995) defined an examination as a formal test of somebody's knowledge or ability in a particular subject, especially by means of answering questions or practical exercises. The process through which students are assessed to understand the quality of what they know in a certain period of time is an examination (Balogun 1999). An examination could be oral or written, essay or objectives, theory or practical.

Whatever the means or instruments of education evaluation, the enhancement of test or examination fairness across a group of testees is very crucial, as the results of such tests or examinations will be used to pass value judgment and make important decisions about the testees.

A test that is not biased provides equal chance to all testees to demonstrate the skills and knowledge which they have acquired and which are vital to the purpose of the test. Testees or test takers of the same latent trait should respond to test items correctly irrespective of their school location, school type or gender (Ogbebor, 2012). Roeber (2005) defines a fair test as one that gives all examinees equal chance to exhibit their skills and knowledge which they have acquired and which are relevant to the test's purpose.

Some group of testees could be favoured in some test outcomes while others are disadvantaged not on the basis of the trait being measured but by some factors that have no relationship to the test/examination being undertaken. Such tests are considered to be biased against the group of testee. The presence of bias is a fundamental problem that needs to be taken care of since bias can lead to systematic errors that affect the inferences made in the classification and selection of students (Zumbo, 1999).

Item bias is the presence of some extraneous elements present in the items that cause differential performance for individuals of the same ability but from different specified subgroups. Zumbo (1999) observed that item bias occurs when examinees of one group are less likely to answer an item correctly than examinees of another group only because of some characteristics of the test item or testing situation that is not relevant to the test purpose. Several questions arise concerning whether higher average test scores by certain groups of testees (gender, age or parental background) are due to actual achievement differences, the bias in a test or some combination of both (Le, 1999).

A biased item measures attributes irrelevant to the tested construct (Williams, 1997).

Frequently, examination items are considered biased because they contain sources of difficulty that are not relevant to the construct being measured and these extraneous sources impact test-takers' performance (Zumbo, 1999). An item might also be considered biased if it contains language or content that is differentially difficult for different subgroups of test-takers. In addition, an item might demonstrate item structure and format bias if there are ambiguities or inadequacies in the item stem, test instructions, or distractors (Hambleton & Rodgers, 1995).

Nworgu, (2011), revealed that current research evidence has implicated test used in the national and regional examinations as functioning differently with respect to different subgroups. This means that students' scores in such examinations are determined largely by the group to which an examinee belongs and not by ability. Adedoyin (2010) in his study on investigating gender-biased items in public examinations found that, out of 16 test items that fitted the 3PL item response theory statistical analysis, 5 items were gender biased

The statistical technique used to assess the presence of item bias is Differential Item Functioning. The North Central Regional Educational Laboratory (1996) referred to Differential Item Functioning analysis as a procedure used to determine if test questions are fair and appropriate in assessing the knowledge of various groups present among the testees. It is said to be based on the assumption that test takers who have similar knowledge (based on the total score) should perform in similar ways in the individual test questions regardless of their sex, race or ethnicity. However, Differential Item Functioning analysis alone is not sufficient to declare an item biased, other follow-up analysis, such as content analyses, empirical evaluation, are being employed.

Worthy of investigation, is item bias in chemistry as one of the core science subjects, as performance differences are often found between gender (male and female), location (rural and urban), school type (public and private), ethnicity and the like. This study, therefore, found out the gender biased items in

teacher made assessment in chemistry using Differential Item functioning approach.

Research Question

- 1 How do the test items of teacher-made Chemistry test function with respect to gender?

Hypothesis

H_0 : There is no significant gender difference in students' response in teacher made Chemistry test.

H_1 : There is a significant gender difference in students' response in teacher made Chemistry test.

METHODOLOGY

This study adopted a survey research design. Multistage sampling technique was used to select three hundred and fifty (350) SS II Chemistry students that participated in the study from Obio/Akpor Local Government Area of Rivers State in Nigeria. The instrument (teacher-made chemistry test) was administered by 4 trained research assistants. The instruments were adequately scored and coded by the researcher. Each correct response was scored '1' while each incorrect response was scored '0'. The likely Maximum Likelihood Estimation technique of BILOG MG computer programme was used to analyze the data collected. This technique was used to answer the research

question while the hypothesis was tested using the t-test analysis of the SPSS Computer Programme at 0.05 level of significance.

Results

Research Question 1: How do the test items of teacher-made Chemistry test function with respect to gender?.

Table 1: IRT Analysis with respect to Gender in the selected teacher made Chemistry items.

Table 1 shows the IRT DIF statistics on examined item performance with respect to respondent gender. Column 2 of the table gives the adjusted difficulty parameter estimates on the items for male, while column 3 gives the difficulty parameter of the items for the female respondent. Column 4 gives the group difficulty differences. A difference greater than ± 0.5 indicates the presence of DIF. Phase 2 of the BILOG MG model gives the statistics in column 2, 3, and 4 for group differential item functioning. 53 items out of 100 have group difficulty differences of ± 0.5 .

Hypothesis: There is no significant gender difference in student's response in teacher made Chemistry test.

Table 2: Independent t-test showing gender difference of students' responses to the teacher made Chemistry test items

GENDER	N	Mean	Std. Deviation	df	T	sig	D
Male	183	41.09	15.73	348	-1.726	0.085	0.18
Female	167	44.34	19.42				

Table 2 shows the t-value and significant (p) value of the group. When the items were subjected to a t-test, the result showed that there was no significant difference in the testees' responses to the items for the teacher made Chemistry test. The result showed that $t(348) = -1.726, p > 0.05$. This showed that the

mean difference of male ($x=41.09$, S.D = 15.73), ($x=44.31$, S.D = 19.42) was not statistically significant and the effect size ($d=0.18$) indicated no effect. Therefore the null hypothesis was not rejected and the alternative hypothesis was rejected.

ITEM	GROUP			Remark
	MALE	FEMALE	DIFFERENCE	
CH001	-5.392	-4.567	0.825	Favoured male
CH002	-1.273	-1.66	-0.387	No DIF
CH003	-0.411	2.096	2.507	Favoured male
CH004	-1.007	-1.006	0	No DIF
CH005	-2.961	-3.42	-0.459	No DIF
CH006	-2.846	-1.482	1.364	Favoured male
CH007	-3.278	-1.043	2.235	Favoured male
CH008	-0.839	-1	-0.161	No DIF
CH009	-0.071	-0.439	-0.368	No DIF
CH010	-1.171	-1.742	-0.571	Favoured male
CH011	-0.056	1.54	1.596	Favoured male
CH012	6.238	9.468	3.23	Favoured male
CH013	1.802	1.337	-0.465	No DIF
CH014	-1.381	-1.847	-0.465	No DIF
CH015	-7.345	-11.013	-3.668	Favoured female
CH017	-0.506	-0.863	-0.357	No DIF
CH018	-0.694	-0.803	-0.108	No DIF
CH019	-0.123	-0.636	-0.513	Favoured female
CH020	-0.308	-0.651	-0.343	No DIF
CH021	-0.913	-0.974	-0.06	No DIF
CH022	1.177	1.127	-0.05	No DIF
CH023	12.693	10.884	-1.809	Favoured female
CH024	0.734	2.044	1.31	Favoured male
CH025	-1.388	-1.253	0.136	No DIF
CH027	2.178	2.555	0.377	No DIF
CH028	0.374	-0.123	-0.498	No DIF
CH029	0.038	10.131	10.093	Favoured male
CH030	-1.062	3.329	4.391	Favoured male
CH031	-0.659	-1.535	-0.876	Favoured female
CH032	-0.204	-0.284	-0.08	No DIF

CH033	0.427	1.645	1.218	Favoured male
CH034	0.849	2.039	1.19	Favoured male
CH035	5.864	6.329	0.465	No DIF
CH036	0.854	0.19	-0.665	Favoured female
CH037	-6.448	-5.941	0.507	Favoured male
CH038	1.46	1.139	-0.321	No DIF
CH039	0.178	-0.376	-0.554	Favoured female
CH040	1.091	1.554	0.464	No DIF
CH041	4.808	-0.913	-5.722	Favoured female
CH042	-1.179	-1.17	0.009	No DIF
CH043	1.121	1.76	0.639	Favoured male
CH044	-1.085	-1.067	0.018	No DIF
CH045	3.493	0.917	-2.576	Favoured female
CH046	-0.83	-0.877	-0.047	No DIF
CH047	-0.323	-0.145	0.178	No DIF
CH048	0.393	1.913	1.52	Favoured male
CH049	-0.57	-1.277	-0.707	Favoured female
CH050	-0.823	-1.036	-0.213	No DIF
CH051	-1.269	-1.961	-0.692	Favoured female
CH052	1.616	8.68	7.064	Favoured male
CH053	-0.245	-1.212	-0.967	Favoured female
CH054	-0.592	-1.006	-0.414	No DIF
CH055	3.824	-3.7	-7.525	Favoured female
CH056	0.836	2.071	1.235	Favoured male
CH057	0.7	1.13	0.429	No DIF
CH058	14.693	17.096	2.404	Favoured male
CH059	2.637	1.611	-1.027	Favoured female
CH060	1.38	0.346	-1.035	Favoured female
CH061	12.413	4.974	-7.439	Favoured female
CH062	1.842	0.555	-1.287	Favoured female
CH063	0.413	-0.226	-0.639	Favoured female
CH064	-0.76	-0.943	-0.183	No DIF
CH065	0.2	-0.328	-0.528	Favoured female
CH066	-0.818	0.028	0.846	Favoured male
CH067	-0.612	-0.807	-0.195	No DIF
CH068	0.218	0.614	0.396	No DIF
CH069	0.31	1.257	0.947	Favoured male
CH070	0.754	0.773	0.019	No DIF
CH071	1.229	1.681	0.452	No DIF
CH072	1.15	2.03	0.88	Favoured male
CH073	0.881	0.094	-0.788	Favoured female

CH074	-1.487	-1.042	0.445	No DIF
CH075	-0.956	-1.074	-0.117	No DIF
CH076	5.685	-5.127	-10.812	Favoured female
CH077	0.179	-1.007	-1.186	Favoured female
CH078	-0.357	-0.318	0.04	No DIF
CH079	0.816	0.32	-0.496	No DIF
CH080	-0.165	-0.496	-0.331	No DIF
CH081	1.633	1.767	0.133	No DIF
CH082	-0.324	-0.622	-0.299	No DIF
CH083	0.427	-0.264	-0.691	Favoured female
CH084	2.105	6.935	4.83	Favoured male
CH085	1.65	1.482	-0.168	No DIF
CH086	17.835	18.979	1.144	Favoured male
CH087	-0.06	0.01	0.069	No DIF
CH088	11.645	11.68	0.035	No DIF
CH089	1.754	1.903	0.149	No DIF
CH090	6.361	2.971	-3.39	Favoured female
CH091	1.664	-0.534	-2.198	Favoured female
CH092	0.98	0.126	-0.854	Favoured female
CH093	6.546	2.443	-4.103	Favoured female
CH094	-0.44	-0.182	0.258	No DIF
CH095	-0.97	-0.243	0.727	Favoured male
CH096	6.987	16.53	9.543	Favoured male
CH097	-1.824	-0.034	1.79	Favoured male
CH098	0.429	0.288	-0.141	No DIF
CH100	-0.114	1.326	1.439	Favoured male

Table 3 shows the t-value and significant (p) value of the group. When the items were subjected to a t-test, the result showed that there was no significant difference in the testees' responses to the items for the teacher made Chemistry test. The result showed that $t(348) = -1.726$, $p > 0.05$. This showed that the mean difference of male ($x = 41.09$, $S.D = 15.73$) to female ($x = 44.31$, $S.D = 19.42$) was not statistically significant and the effect size ($d = 0.18$) indicated no effect. Therefore the null hypothesis was not rejected and the alternative hypothesis was rejected.

Discussion

This study investigated gender-related Differential Item Functioning (DIF) in a teacher-made chemistry test. It was revealed that out of one hundred teacher

made chemistry test administered to SS2 students, fifty-three items showed DIF. Twenty-six (26) items were more difficult for male testees whereas twenty-seven (27) items were more difficult for female testees. This finding shows that 53 of the items measured different things other than Chemistry ability purported to be measured.

The finding of this study agrees with the work of Ogbebor (2012) who found that ten (10) out of sixty(60) items in NECO Economics questions showed DIF between the rural public schools and private schools, while the private schools were more disadvantaged. The finding further agrees with the findings of Adedoyin (2010) who investigate gender-biased items in public examinations. It was

discovered that out of 16 test items that fitted the 3PL item response theory statistical analysis, 5 items were gender biased.

Furthermore, when the teacher made Chemistry test was subjected to t-test, it showed that there was no significant gender difference in the students' response to the items. This finding was in agreement with Adeleke and Olabode (2017) who found no significant difference in gender performance in Mathematics items of WAEC 2013 objectives examination. This finding affirms the position of Nworgu (2011) who argued that the presence of DIF in an item does not necessarily mean that the item is biased.

Based on the findings of this study, it was concluded that there was the presence of gender bias in the teacher made Chemistry test, though the difference in gender performance was not statistically significant. Notwithstanding, the fact that there was no significant difference in gender performance does not mean that there were no problems. The difference considered was a group aggregate, whereas, some individual students will be badly affected. On the basis of the findings, it is therefore recommended that test items should be subjected to DIF analysis to identify both uniform and non-uniform biased items. This will guide against items with DIF from reducing the power of the test.

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Effects of computer graphics and animation instructional modes on Junior Secondary Students' learning outcomes in business studies in Ibadan, Nigeria

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Abstract

The study investigated the effects of computer graphics and animation instructional modes on students' achievement in Business Studies. The study adopted a pretest-posttest control group quasi-experimental design. Schools in Ibadan were clustered along the two existing educational zones. From each zone, two Local Government Areas (LGAs) from Ibadan city and one LGA from Ibadan less city were randomly selected. Purposive sampling technique (based on schools that had functional computers) was adopted in selecting three public junior secondary schools in each LGA, totaling nine schools. Thirty junior secondary students in each of the schools were randomly selected making a total of 270 students. The instruments used were: Business Studies Achievement Test ($r = 0.86$) and Business Studies Self-Efficacy Questionnaire ($r = 0.82$). Three hypotheses were tested at $p = \leq 0.05$. Data were analysed using ANCOVA. There was a significant main effect of treatment on students' achievement in Business Studies ($F_{(2,257)} = 137.78$, $\eta^2 = 0.52$). The result shows that students who had high self-efficacy did better than students who had low self-efficacy in the tests. Furthermore, there was a 2-way significant interaction effect of treatment and self-efficacy ($F_{(2,257)} = 7.03$, $\eta^2 = 0.05$) on students' achievement in Business Studies. Therefore, computer graphics and animation instructional modes improved students' achievement in Business Studies. Self-efficacy is also a factor in students' achievement. It was recommended that teachers should use computer graphics and animation instructional mode to improve the teaching of ICT aspect of Business Studies.

Keywords: Computer Graphics Instructional Mode, Computer Animation Instructional Mode, Students' Achievement in Business Studies and Self-Efficacy.

Introduction

In this age of technological advancement, the world has witnessed a revolution in the way and manner things are done. The tremendous development witnessed in technology has made it possible for our daily activities to be easy and faster. This includes the aspects of communication, e-banking, e-commerce, e-learning among others. The dynamics of the present technological age has created a completely new world of interaction and learning. In view of this, every country of the world is embracing new technologies in order to have a sense of belonging and be relevant technologically. Indeed, technology has become vital in professional fields like medicine, commerce, and industry, entertainment, and education among other areas.

In the present century, an inspiring and entrancing tactic has to be stimulated to assist students to learn effectively, comprehend and review ideas and make contributions for future development. In this regard, out of auspicious tactics, as indicated by Mayer, Dow & Mayer (2003) and Adegoke (2010) includes multimedia display bolstered in visual and verbal arrangements complemented with pictures, animations, texts, and narrations. Media refers to the system used to present instruction, such as a book-based medium, video-based medium or a computer-based medium, while, mode means the method employed to teach, such as words (verbal) versus pictures (non-verbal). Modality means the information processing channel, which is employed by the students to comprehend the information, such as auditory versus visual (David, 2015).

This study focused on how combinations of modes and modalities may affect students' learning outcomes; for instance, how visual-verbal material (i.e., text) or auditory-verbal material (i.e., narration) is merged with visual-non-verbal materials (i.e., graphics, video or animations). In this study, the mode is grouped into three namely; view mode, trial mode and test mode. The view mode is meant for students to observe the teaching package instruction, the trial mode is for students to practise what they have observed or seen in the view mode and the test mode is for students to assess themselves as well as the teachers assessing the students. The instructional process carried out with the help of the computer is known as Computer Assisted Instruction (CAI). The use of (CAI) is an interactive instructional method whereby a computer is used to present instructional materials and evaluate the learning that occurs. By introducing Information and Communication Technology (ICT) into schools, students can be better prepared for adult life. If the technology helps students learn, then they may be able to catch up with students in other countries. According to Yusuf & Afolabi (2010), the use of computer-assisted instruction (CAI) is a supplement to conventional method which produced higher achievements by the learners than using conventional method alone. Akinola & Adodo (2002) indicated that computer-assisted instruction is a process by which students learn fast. The purpose of CAI for students is to promote necessary progress and provide a solution to the problems of teaching and learning process. Indeed, CAI provides immediate feedback, for students to know whether their answer is correct or not. It also offers different types of activities and a change of pace from teacher to group instructions. However, subjects that consist of skills such as Business Studies should be taught practically using computer as it is stipulated in the curriculum.

Business Studies is now one of the compulsory subjects which students in the junior secondary school offer. Business Studies is a basic subject that may assist students to acquire more aptitudes which are normal and fundamental to all close personal and occupational exercises

(Adeyemo, 2013). Business activities influence the everyday living of all citizens as they work, spend, invest, travel and play. It impacts occupations, salaries and open doors for the individual venture. It has a vital impact on the way of life and personal satisfaction of individuals, and on nature in which they live and which future ages can acquire (Ekanem, 2008). It seems Business Studies has not been properly implemented in Nigerian secondary schools because of the bias against vocational education.

Business Studies is a commercial subject that formed the essential foundation in the Junior Secondary School system in Nigeria. Okonkwo cited in Wosu (2016) viewed Business Studies as the bedrock of technology. Business Studies is one of the aspects of vocational education which provides people with the essential skills and theoretical knowledge needed for performance in the business world either for government employment or for self-employment. The Federal Republic of Nigeria (FRN) (2004) emphasised the inclusion of vocational and technical education subjects in the curriculum in order to make the recipients immediately employable or self-reliant on leaving school. To this end, the secondary school system is presented in two stages, namely the Junior Secondary School (JSS) and the Senior Secondary School (SSS).

However, the broad goals of the secondary education are (a) the preparation of the students for useful living in the society and (b) the preparation of students for higher education. Under the senior secondary system of education, the following business subjects are offered: Typewriting, Shorthand, Book-keeping, and Financial Accounting, Office Practice, Commerce, Computer and Economics. The components of business studies include Typewriting, Shorthand, Book-keeping, Office Practice, Computer and Commerce which are offered at the junior secondary school level.

Business Studies consists of skill and non-skill subjects. The Comparative Education Study and Adaptation Center (CESAC) reviewed in 2001 itemized the goals of Business Studies as follows:

- i. to help the student to procure the

- fundamental information of Business Studies;
- ii. to improve the essential abilities in office occupations;
- iii. to help student for further training in Business Studies;
- iv. to give an introduction and essential abilities with which to begin a real existence of work for the individuals who may not experience further training;
- v. to offer essential abilities for individual use later on;
- vi. to impart the information and abilities to the national economy

However, Business Studies includes a number of skills such as keyboarding as a communication tool, computer skills in business studies, typewriting skills, but this study focused on keyboarding as a communication tool such as page set-up, techniques development in keyboarding, paragraphing, printers' correction signs and marks, ledger entries which can only be taught and developed systematically. Students' poor performance in Business Studies at present may be related to the fact that they are not taught with the appropriate teaching methods and instructional aids. Even the skills aspect which is supposed to be taught practically, are being taught within the four corners of the classrooms theoretically. Wosu (2016) affirmed that the performance of students in Junior Secondary Certificate Examination Business Studies has been declining, the students' attitude towards Business Studies tends to be negative and most of the Business Studies teachers have been inadequate and ill-prepared for the teaching of Business Studies. Therefore, the application of appropriate teaching method is crucial to successful teaching and learning of the subject. As a matter of fact, Alio and Harbour (2000) claimed that the instructional strategy employed by the teacher influences the cognitive and affective outcomes of students.

The conventional method is teacher-centered with little or no participation of students; consequently, they remain passive listeners (Joshi, 2008). This method as observed by

Babawale (2013) is popularly known as talk-and-chalk method. This implies that the teacher could sometimes, if he wishes, write on the chalkboard as he talks, explaining and summarising his lesson. As a result, the students' involvement and participation are very low because communication is often one way for most of the time in the teaching process. The conventional method will not be effective for teaching Business Studies especially the practical skill aspect of the subject since it does not arouse participatory learning, hence dearth retentive quality. Therefore, in order to alleviate the problem of the teaching of Business Studies concepts, the use of lecture method complemented with computer graphics and lecture method complemented with computer animation could be innovative instructional strategies.

Sangodoyin (2011) affirmed that computer graphics and animation instructional modes should be used to teach Biology and other subjects, in which Business Studies could be one of the subjects. Also, Owolabi and Oginni (2014) ascertained that there is a significant difference in the performance of students exposed to cartoon animation than their counterparts exposed to lecture method only.

Computer graphics and animation are sub-categories in educational technology. Computer graphics is the creation, storage, and manipulation of colors, drawings, and pictures with the aid of a computer system (Anna, 2015). They are produced from by an extensive range of rendering software. Chen, Shi & Xuan (2007) opined that due to innovation in the rendering method, computer graphics designs show up so practical that it might be utilized as a convincing type of photographic picture falsification. The most popular graphics software packages used for graphics instructional modes are CorelDraw, Microsoft power point and computer-aided design (CADs).

According to Sangodoyin (2011), the graphics presentation modes are designed to help teachers produce high-quality learning packages, concepts, and ideas or lesson plan that are interesting to learners and effective in its ability to convey teacher's message.

Therefore, this study used Microsoft powerpoint, Corel draws and Snagit for the software package to teach the selected topics.

On the other hand, animation refers to life in graphics. It is a motion-picture shown by employing a series of drawings, images of objects that are slightly completely different from each other which once viewed quickly, one after another form the look of movement (Pilling, 1992). Literally, animation is moving something (text and image) that cannot move by itself. Mayer and Moreno (2002) allude to animation as a mimicked film portraying development of drawn (or replicated) objects or as an image in motion. According to Sanchez, Canas, & Novak, (2010), educational animations are animations made for the precise purpose of nurturing learning. The recognition of exploitation of animations assists students to perceive and bear in mind that information has significantly improved since the appearance of powerful graphics-oriented computers. Thus, teachers are not any longer restricted looking forward to static graphics however will without delay convert them to into educational animations (Pilling, 1997).

Animation teaching might be in form of lesson presentation, such that, still pictures; content, designs, motion pictures, foundation sound, as well as some narrations are being consolidated at a proportional time in order to fortify students' comprehension of thoughts. The adaptability of learning through animation permits more extensive stimuli accordingly expands the students' dynamic participation in learning. Hoffler & Leutner (2007) studied the effect of instructional animation versus static pictures and found out that animation presentation is superior over static picture presentation. The study of Gokhan (2013) found that computer animation method is more effective than conventional teaching methods in terms of improving students' achievement. Likewise, Yisa (2014) found that the performance of students taught with animation instructional package was better than their counterpart taught with the conventional method. This study used Microsoft power point, Corel draw, Flash and Adobe captivate to develop software package used to teach the selected topics for the study.

Self-efficacy refers to as trust in one's ability and actualizing the intellectual, conduct, or social aptitudes vital for the successful performance of a task (Zimmerman, 2000). Ormrod (2006) refers to self-efficacy as the belief that one is capable of performing in a certain way to achieve definite goals. According to Olayemi (2006), self-efficacy has a great influence on the choice people make and their actions to accomplish a specific task. It is a person's perception of him or her to plan for and to take action to reach a particular goal. Studies have been carried out on self-efficacy as it relates to achievement. Ilori (2004) investigated the relationship between self-efficacy and academic achievement among secondary school students. The result of the findings showed that there was no significant relationship between self-efficacy and academic achievement of secondary school students. Durowoju (2014) found no significant effect of self-efficacy on students' achievement in Commerce

However, it is imperative that a study to verify the above variable on learning outcomes in Business Studies be undertaken. Therefore, this study found out whether self-efficacy in any way has influence on the use of computer graphics and animation instructional modes in teaching Business Studies in junior secondary schools.

Statement of the Problem

Business studies occupy a fundamental position in Nigeria's move towards an industrial breakthrough, as the subject is a vocational subject currently taught in junior secondary schools in the country. However, the current method of teaching the subject in school that is the traditional method is inadequate this digital era. Business Studies curriculum for Junior Secondary School specifies that the skill aspects (paragraphing, techniques development in keyboarding, page set-up, printers' correction signs and marks) should be taught practically, using a computer. It is however observed that the skills aspect of the subject is presently taught theoretically in the schools and also examined theoretically without the use of computers. Such shortcoming leaves secondary school graduates ill-equipped for work life.

In addition, students' performance in Business Studies is not encouraging. A number of studies have been carried out by researchers in an attempt to identify what may be responsible for students' poor performance and poor acquisition of skills in the subject. Many of these studies looked at school, teachers, students, class-size and home as factors that may be hindering teaching and learning of the subject. But it seems none of these studies has addressed the issue of instructional strategies, especially as it relates to the use of computer graphics and animation instructional modes on Junior Secondary School II (J.S.S 2) learning outcomes in Business studies in South West, Nigeria. Therefore, this study found out whether self-efficacy influence computer graphics and animation instructional modes on learning outcomes in Business Studies in Ibadan.

Hypotheses

The study tested the following three hypotheses at 0.05 level of significance.

- H_{01} There is no significant main effect of treatment (Computer graphics and animation instructional modes) on students' achievement in Business Studies.
- H_{02} There is no significant main effect of self-efficacy on students' achievement in Business Studies.
- H_{03} There is no significant interaction effect of treatment (Computer graphics and animation instructional modes) and self-efficacy on students' achievement in Business Studies.

Methodology, Population, Sampling Technique and Sample

This study adopted a pretest-posttest, control group and quasi-experimental design. The population of this study comprised all Junior Secondary School 2 students and their teachers in public schools in Ibadan, Oyo state. Nine public schools were purposively selected from

the three local government areas in Ibadan. The nine schools that participated in the experimental study;

- i. had at least ten functioning computers system with a standby generator each;
- ii. had poor performance in Business Studies for the past ten years;
- iii. were co-educational and;
- iv. were far from one another in terms of distance to avoid undue interaction among the participants of one school and the other.

The selected schools were randomly assigned to each of the treatment. That is, three schools were assigned to each of the groups (Computer graphics instructional modes, computer animations instructional modes and conventional lecture method of teaching). Lastly, in each of the schools that were selected, simple random sampling technique was adopted to select an arm of JS II. The class was chosen because the class had covered a large proportion of the Junior Secondary School's Business Studies curriculum thereby having sufficient knowledge in Business Studies. Also, simple random sampling technique was employed to select thirty JSS2 students from each of the nine selected schools making a total of two hundred and seventy students.

Business Studies Achievement Test (BSAT)

Business Studies Achievement Test (BSAT) was used in the study for the purpose of data collection. BSAT was developed by the researchers to measure the achievement of the students using a table of specification. It consisted of two sections, A and B. Section A had information on students' personal profile such as name school, class, and gender. Section B had forty multiple choice items. The contents of the topic were picked as indicated in JSS 2 Business Studies syllabus. The generated items were given to expert in Business Studies as well as experienced secondary school Business teachers for vetting.

The contents areas covered techniques development in keyboarding, paragraphing, page set-up, printers' correction signs and ledger entries. The pilot testing was done by administering the items to a randomly selected

60 J.S.S.2 students who did not take in the study. The reliability of the items of the test was established using Kuder-Richardson Formula (KR_{20}) which yielded a reliability coefficient of 0.86. Items with the discrimination index above 0.3 and difficulty level indices between 0.40 and 0.60 were included in the final test. The result of item analysis helped to reduce the number of items from eighty (80) to forty (40). BSAT was dichotomously scored. 1 mark was assigned to a correct response, while 0 was assigned to a wrong response.

Business Studies Self-Efficacy Questionnaire (BSSEQ)

This questionnaire was developed by the researcher with the assistance of some lecturers in the Institute of Education to determine the extent to which students' academic self-efficacy determined achievement. It consisted of two sections: A and B. Section A was on biodata of the students, name, and name of school while section B contained twenty (20) items. The respondents responded along with 4-point Likert scale response options, Very True of Me (VTM), True of Me (TM), Fairly True of Me (FTM), Not True of Me (NTM). The BSSEQ was trial tested using 100 J.S.S.2 students who did not take part in the study to establish the psychometric property of the instrument. The result of the items analysis helped to reduce the items to twenty (20). Cronbach Alpha was used to establish internal consistency and reliability coefficient of BSSEQ. The reliability of the instrument was found to be 0.82. Each of the positive items was scored as follows: 4,3,2, and 1 for Very True of Me, True of Me, Fairly True of Me, Not True of Me. Negative items were reversed in the opposite way.

Treatment and Procedure

Two treatment packages were prepared by the researcher as a guide for the research assistants (Business Studies teachers) that participated in the study. The nine selected schools were assigned to treatment and control groups. The pre-test was administered to participants before the treatment. The two groups were exposed to treatment after which post-test was administered on them.

This refers to the instructional package guide for the research assistants (Business Studies teachers) that participated in the study. Computer Graphics Instructional Package (CGIP) and Computer Animation Instructional Package (CAIP) consisted of five topics in business studies: Techniques development in keyboarding; Paragraphing; Page set-up; Ledger entries; and Printers' correction signs. The necessity for researcher-made computer package was based on the fact that the commercially produced computer graphics and animation packages were not common. Even, if they were available, they may not be directly relevant to the topics and the objectives to be achieved in this study. As a result of this, developing a computer packages for use by the researcher was inevitable. This was packaged by the researcher in line with suggestions and contributions of experienced computer graphics and animation designers, lecturers in educational technology as well as experts in the field of research.

Computer Graphics Instructional Guide (CGIG)

Computer Graphics Instructional Guide was designed by the researcher to serve as a guide for research assistants in the Experimental Group I. The instrument was given to experts in the field of evaluation, in the field of educational technology as well as some experienced Business Studies teachers for constructive criticism. This was later trial tested on 30 students, who did not participate in the study to see the work ability of the instrument.

Computer Animation Instructional Guide (CAIG)

Computer animation instructional guide was designed to serve as a guide to the research assistants in computer animation group. The instrument was subjected to scrutiny and constructive criticism by research experts as well as seasoned Business Studies teachers. The instrument was trial tested on 30 students who were not part of the study to establish its

appropriateness.

Conventional Method Instructional Guide (CMIG)

Conventional method instructional guide was written by the researcher based on the prevailing conventional methods of teaching in schools. Students in this group were not exposed to any treatment (computer graphics and animation instructional modes) packages. The students were given tasks to carry out in the form of class work exercises and homework just as those who

were in the treatment groups.

Data Analysis

The study adopted the Analysis of Covariance (ANCOVA) to analyze the data collected. This is to test for the significant differences between group mean and to control for the effect of covariates.

Results

Hypothesis 1: There is no significant main effect of treatment (computer graphics and

Table 1: Analysis of Covariance (ANCOVA) of Effects of Treatment, and Self efficacy on Students' Achievement in Business Studies.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6764.854	12	563.738	35.975	.000	.627
Intercept	8261.571	1	8261.571	527.206	.000	.672
Pre-Achievement Test	15.469	1	15.469	.987	.321	.004
Main Effects:						
Treatment	4318.329	2	2159.164	137.785	.000	.517
Interest	195.562	1	195.562	12.480	.000	.046
Self-Efficacy	51.801	1	51.801	3.306	.070	.013
2-Way Interactions Effect						
Treatment*Interest	33.774	2	16.887	1.078	.342	.008
Treatment * Self-Efficacy	220.390	2	110.195	7.032	.001	.052
Interest * Self-Efficacy	.354	1	.354	.023	.881	.000
3-Way Interactions Effect						
Treatment * Interest * Self-Efficacy	129.688	2	64.844	4.138	.017	.031
Error	4027.312	257	15.670			
Total	184833.000	270				
Corrected Total	10792.167	269				
a. R Squared = .627 (Adjusted R Squared = .609)						

Table 1 reveals that after adjustment for the covariate, there is a significant main of treatment on students' achievement in Business Studies, $F_{(2,257)} = 137.785$, $p < 0.05$). The hypothesis which stated that there is no significant main effect of treatment on students'

achievement in Business Studies was rejected. The partial eta squared estimate was 0.517. This implies that 51.7% of the variance observed in the achievement test was due to treatment.

Table 2: Estimated Marginal means of Students' Achievement in Business Studies by Treatment.

Treatment	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Graphics	25.197 ^a	.545	24.125	26.269
Animation	30.641 ^a	.456	29.743	31.538
Control	19.480 ^a	.492	18.510	20.450

Table 2 shows that students in experimental group II (Animation Instructional Mode) had the highest mean score of ($\bar{x}$ = 25.197 while, the control group had the mean score $\bar{x}$ = 19.480

Hypothesis 2: There is no significant main effect of self-efficacy on Junior Secondary two achievement in Business Studies.

Table 1 indicates that there was no significant main effect of self-efficacy on Junior Secondary two students in Business Studies, $F_{(1,257)} = 3.306$; $p > 0.05$. Consequently, the null hypothesis that stated that there is no significant main effect of self-efficacy on junior secondary two in achievement was not rejected.

Table 3: Marginal Means of Students' Achievement by Self-efficacy in Business Studies

Self-efficacy	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low	24.591 ^a	.392	23.820	25.367
High	25.620 ^a	.408	24.818	26.423

Table 3 presented the marginal means of students' achievement in Business Studies by self-efficacy. It indicated that students with high self-efficacy had the higher mean score of $\bar{x}$ = 25.620 while students with low self-efficacy had the lower mean score of $\bar{x}$ = 24.591, $\bar{x}$ = 30.641, followed by students in experimental group I (Graphics Instructional modes) with the mean score of $\bar{x}$ = 25.197. The difference in their mean score was statistically significant.

Hypothesis 3: There is no significant interaction effect of treatment and self-efficacy on students' achievement in Business Studies.

Table 1 shows that there was a significant interaction effect of treatment and self-efficacy on students' achievement in Business Studies, $F_{(2,257)} = 7.032$; $p < 0.05$. The null hypothesis that stated that there is no significant interaction effect of treatment and self-efficacy on students' achievement in Business Studies was therefore rejected.

Table 4: Marginal Mean of Students' Achievement in Business Studies by Treatment and Self-Efficacy

Treatment	Self-efficacy	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Graphics Instructional Mode	Low	25.784 ^a	.527	24.747	26.822
	High	24.610 ^a	.944	22.751	26.468
Animation Instructional Mode	Low	28.757 ^a	.710	27.359	30.155
	High	32.524 ^a	.538	31.464	33.585
Conventional Method	Low	19.233 ^a	.789	17.680	20.786
	High	19.727 ^a	.590	18.565	20.889

Table 4 shows that students with low self-efficacy in the animation instructional mode had the highest mean score ($\bar{x}$ = 28.757) in achievement in Business Studies; followed by

students with low self-efficacy in the graphics instructional mode with the mean score ($\bar{x}$ = 25.784), while students with low self-efficacy in the conventional teaching method had the lowest

mean score ($\bar{x}$ = 19.233). In addition, Table 4 indicated that students with high self-efficacy in the animation mode had the highest mean score ($\bar{x}$ = 32.524) in achievement in Business Studies; followed by students with high self-efficacy in the graphics instructional mode with the mean score ($\bar{x}$ = 24.610), but the students with high self-efficacy in the conventional teaching

method had the lowest score of mean ($\bar{x}$ = 19.727). The difference in their mean was statistically significant.

In order to examine the nature of interaction, a line graph was constructed to disentangle the interaction as shown in Fig. 1

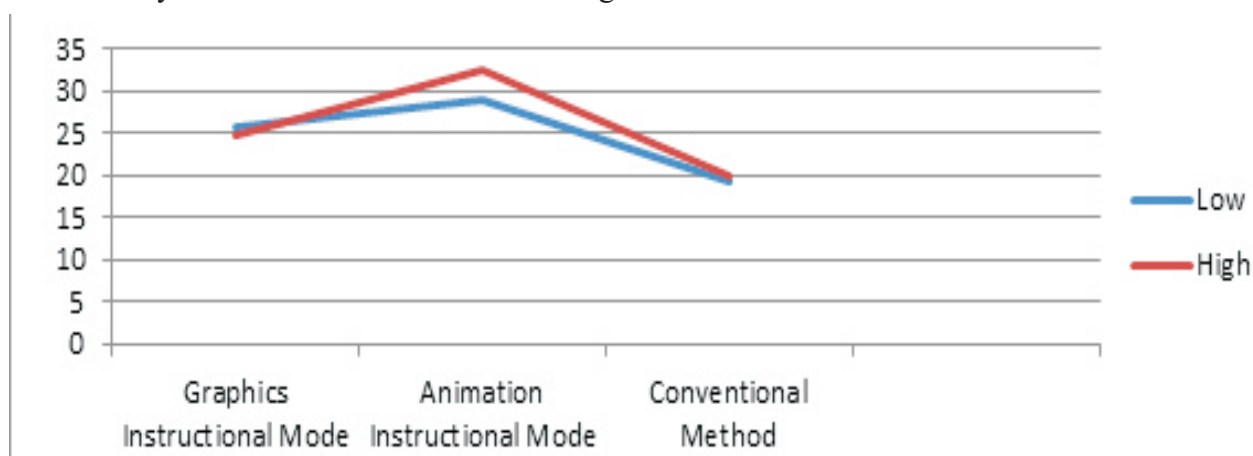


Fig. 1: Interaction Effect of Treatment (Computer Graphics and Animation Instructional Modes) and Self-Efficacy on Students' Achievement in Business Studies.

Fig. 1: shows that students that have low self-efficacy (25.784) performed better than students that have high self-efficacy (24.610) using graphics instructional mode, but for students who have high self-efficacy (32.524) performed better than students that have low self-efficacy (28.757) in animation instructional mode. In similar vein, students in conventional method (control group) that have high self-efficacy (19.727) performed better than students who have low self-efficacy (19.233). Observing the interaction critically, one can conclude that the statistical difference was stronger with students who were taught with animation instructional mode, while those who were taught with conventional method had the least mean scores, with the students with high self-efficacy obtaining higher mean score (19.727) than students with low self-efficacy (19.233).

Discussions

The result showed that there was a significant main effect of treatment (computer graphics and computer animation) on junior secondary students' achievement in Business Studies. The result clearly showed the potency of animation and graphics groups over the conventional

teaching method. This might be as a result of the effectiveness of the teaching methods that were introduced, which allowed students to comprehend the information through diagrams in motion provided by visual stimuli. Also, the orientation given to students before the treatment might have contributed significantly to their performance. Furthermore, the conducive environment filled with real-life objects (animated and graphics) to learn which might have influenced their materials. This is in support of Hoffler & Leutner (2007) who studied the effect of instructional animation versus static pictures and found out that the meta-analysis revealed that animation is superior over static picture presentation.

This study agrees with the study of Gokhan (2013) who discovered that computer animation method is more effective than conventional teaching methods in terms of improving students' achievement. Moreover, the study is in consonance with the findings of Sangodoyin (2011) who found out that there is a significant main effect of treatment (computer graphics and animation) on students' achievement in Biology. The finding is in support of Yisa (2014) who

discovered that the performance of students taught with computer animation instructional package was statistically higher than those taught with the conventional method and that the computer animation was effective in improving students' achievement. The difference is in favor of students exposed to the treatment. However, the findings of this study contradict the results of Haselden (2011) who indicated that traditional teaching was more effective.

The result indicated that there was no significant main effect of self-efficacy on junior secondary school students' achievement in Business Studies. This means that self-efficacy of students irrespective of the level (high or low) does not in any way affect their academic performance. In other words, whether the self-efficacy of students is high or low, their achievement in Business Studies is not likely to be affected if any of the teaching methods are used by Business Studies teacher. Thus, self-efficacy is not a factor to be considered in the improvement of students' achievement in Business Studies. The findings of this study confirm the study of Durowoju (2014) that found no significant effect of self-efficacy on students' academic achievement of secondary school students.

On the other hand, this finding contradicts the studies of Tenaw (2013) that found a significant effect of self-efficacy on students' achievement in Analytical Chemistry. Also, most of the researchers employed survey design as against experimental design adopted in this study. Furthermore, other factors aside self-efficacy could have contributed to the academics' achievement of students. The finding indicated that there was no significant interaction effect of treatment and self-efficacy on students' achievement in Business Studies. This means that treatment and self-efficacy jointly had no influence on students' achievement in Business Studies. The interaction effect of treatment and self-efficacy accounted for less than one percent of the variance observed in students' achievement in Business Studies.

The study earlier showed that the main effect of treatment was significant on students'

achievement in Business Studies. It may mean that when taken both the treatment and self-efficacy interacted together, the effect that treatment had on students' achievement is overcome by that of self-efficacy. Another reason adduced to this result is that the sampling techniques used in the study did not consider the disparity in the level of students' self-efficacy whether high or low, that is students were randomly assigned to treatment group without prejudice to their level of self-efficacy. This may seem to be why the interaction effect of treatment and self-efficacy did not produce a significant effect on students' achievement in Business Studies. Students tend to enjoy equal benefits when given an equal opportunity to learn without being biased.

The findings of this study are in consonance with Bates and Khasawneh (2007) who investigated the influence of a partially mediated model on the perception of self-efficacy in online learning, indicated that the successes the students obtained in the past in online contexts influence their self-efficacy. The finding of the study is also in agreement with the study of Durowoju (2014) that showed that the combination of continuous assessment modes and self-efficacy had no significant effect on students' achievement in Commerce. However, the study contradicts that of Akujieze (2013) who investigated the effect of out of class activity and counseling strategies on learning outcomes in geometry among low-achieving senior secondary students and self-efficacy, found a significant effect of self-efficacy on students' achievement.

Conclusion

The result of this study provides empirical evidence that there is a significant main effect of computer graphics and animation instructional modes on students' learning outcomes in Business Studies. This is an indication that students perform better when the appropriate teaching method is used to teach. Animation instructional model is a teaching method which gives a good way of getting bright ideas and helps learners perform better in Business studies. The result showed that those who are exposed to conventional teaching method had a lower mean score in learning outcome in Business Studies.

Recommendations

The study recommends that:

- i. curriculum planners should ensure that the skills aspect of Business Studies as specified in the curriculum to be taught practically especially with the use of computers
- ii. government should organise seminars, workshop and conferences for teachers to enlighten them on these teaching methods.
- iii. there should be adequate provision of computers and computer rooms in schools, to enhance the effective delivery of instructions.

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Critical thinking as a correlate of numeracy learning outcome among middle basic pupils in Kwara State, Nigeria

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ABSTRACT

Primary education in Nigeria is expected to prepare and produce pupils that can think critically in a reflective manner so as to enhance scientific development and employability skills. This study examined critical thinking as a correlate of numeracy learning outcome among middle basic pupils in Kwara State, Nigeria. Descriptive survey design of correlation type was adopted. The population of the study comprised universal basic education students while the target population comprised pupils of the middle basic schools in Kwara State. Simple random sampling was used at different stages of selection to sample 2, 315 respondents. Three research objectives, three research questions were raised while one research hypothesis was postulated. Two research instruments (Quantitative Reasoning Scale and Numeracy Performance Test) were self-developed and used for data collection. Content Validity was ascertained via Item Level Content Validity Scale (S-CVI) and obtained 87.6 and 92.5 respectively. Test of split-half reliability was adopted and obtained reliability coefficient of KR 0.76 and KR 0.88. The findings revealed that pupils sampled had below average (44.61%) critical thinking in form of quantitative reasoning. Another finding revealed that there was a positive and high significant relationship between critical thinking and learning outcome. It was concluded that critical thinking skills is a significant factor in influencing learners' learning outcomes. It was recommended that examiners (internal and external) should try as much as possible to prepare questions that will require the testees to use higher thinking abilities in solving numeracy tasks both at the terminal and at the end of session. This might develop their potentials in tackling issues and enhancing high learning outcomes.

Key Words: Correlate, Critical Thinking, Learning Outcomes, Middle Basic Schools, Numeracy, Quantitative Reasoning

Introduction

One of the significant aims of functional education is to prepare and produce citizens who will be well informed, that could acquire and understand those principles of education that could be used to solve societal problems. One of the aims and objectives of primary education as stated in the Federal Republic of Nigeria, (2013) is to prepare and produce pupils who will be able to think, act and handle situations in an intelligent manner so that they can tackle their immediate problem (Federal Republic of Nigeria, FRN, (2013). Whatever type of education (primary, secondary or tertiary) that is provided must give room to the learners to acquire different thinking skills that can allow them to reason logically and innovatively. To

achieve this stated objective, pupils must be trained the way they can reason logically, intelligently and critically so as to deal with issues in everyday life.

Thinking is therefore, a process of reasoning about something especially educational issues. It is the thought of mind that is exhibited by an individual which is usually initiated by specific goals that would produce flow of ideas that could solve issues or tasks. There are several ways an individual can think, it could be in form of concrete, abstract, converging, divergent, creative, analytical sequential (linear), holistic and critical. In this study, emphasis is placed on critical thinking.

The word Critical is coined from the Greek word

“*Kritikos*” meaning *ability* to judge. In literature there is no single definition that fully captured the meaning of critical thinking. It could, therefore, be defined as the ability to carefully judge issues or problems in order to determine the accuracy, worth, validity or value of those issues or tasks. Since this definition involves valued judgment it is therefore, connected with the last three levels of Blooms' taxonomy of educational objectives as observed by Ennis (1993). Hence, critical thinking concentrates on: (1) Analyzing—ability to separate material or task into component parts and show relationships between parts. (2) Evaluating—ability to judge the worth of material against stated criteria. (3) Creating—ability to put together the separate ideas or parts to form new whole, establish new relationships (Anderson & Krathwohl, 2001).

Quantitative reasoning produces essential non-numerical inferences about quantities and how they relate in the problem situation. It is often the “glue” that holds arithmetic reasoning and algebraic reasoning together (Smith, & Thompson, 2007). It is the application of basic mathematics skills, such as algebra, to the analysis and interpretation of real-world quantitative information in the context of a discipline or an interdisciplinary problem to draw conclusions that are relevant to students in their daily lives (Peer review, 2014). Quantitative reasoning is also called quantitative literacy and/or mathematical literacy. It focuses on mathematics or statistics acting in the real world.

Learning outcomes could be described as what learners are expected to demonstrate at the end of significant learning experiences. They are actions/performances that are in terms of knowledge, skills and values upon completion of a course or series of several courses. Numeracy learning outcome therefore, a measure of the degree of success in performing specific tasks in numeracy by the learners (pupils) after being exposed to series of instructions (Changeiywo, 2000). Numeracy is one of indices in measuring learning outcomes. The development of numeracy skills in a child begins at the early life of him, even without visiting the four-walls of a classroom.

Numeracy is the ability of an individual to manipulate numbers, figures and to make well-reasoned judgments derived from the numbers and figures at hand in a variety of ways. Education & Training (2009) observed that numeracy is the effective use of mathematics concepts to meet the general demands of life at school and at home, in paid work, and for participation in community and civic life. Numeracy skills involve understanding numbers, counting, solving number problems, measuring, sorting, noticing patterns, adding and subtracting numbers, etc.

The motivation for this study was derived from the statement made by Dwyer, Gallagher, Levin & Morley (2003) that the knowledge of learners' mathematical concepts can help in solving quantitative reasoning tasks and vice-versa. Afshar, Rahimi & Rahimi (2014) *also assumes that* learners with higher level of quantitative reasoning are likely to accomplish high performance in numeracy skills. This study therefore, examined the extent to which findings by these scholars could be upheld.

There have been series of studies that have been carried out by earlier scholars that assessed critical thinking alongside other variables, for example, Emir (2009), education faculty students' critical thinking disposition according to academic achievement. He found that students' critical thinking disposition differed according to academic achievement. It was also found that critical thinking disposition of the students did not show any difference according to academic achievement. It was also observed that academic achievement had no impact on critical thinking and critical thinking disposition. Karagol. & Bekmezci (2015) examined the relationship between academic achievements and critical thinking dispositions of teacher candidates in Faculty of Education. They found that critical thinking dispositions of teacher candidates do not differ according to gender, but on the basis of academic achievement, it differs according to the gender. Their findings also revealed that critical thinking dispositions and academic achievements of teacher candidates do not differ according to type of school. Critical thinking dispositions of teacher candidates differ

according to field of study. However, there was also a positive and weak relationship between critical thinking dispositions and academic achievements of teacher candidates.

Furthermore, Taghva, Rezaei, Ghaderi & Taghva, (2014) studied the relationship between critical thinking skills and students' educational achievement: Case study of Eghlid Universities. The finding of the study revealed that there was a significant relationship between teachers' critical thinking and students' educational achievement. Nordin & Dakwah, (2015) researched on critical thinking as a predictor of students' academic achievement: a study on Islamic Studies students at Pahang Islamic College, Sultan Ahmad Shah, Kuantan. They found that most of the students sampled were in the average level in Watson Glaser Critical Thinking Appraisal (WGCTA), with 99 (65.1%) out 152 respondents sampled. The study also revealed a strong, positive correlation between two variables, with lower level of critical thinking of participants associated with high grades of CGPA. The finding also revealed no correlation between students' critical thinking level and their academic achievement (measured by CGPA).

The second variable of interest is numeracy learning outcome, literature have shown that there have been series of research reports both within and outside Nigeria on numeracy. For instance, the Federal Ministry Education (1999) reported the monitored learning achievement carried out when UBE programme was about to be launched and the findings revealed the national numeracy results in form of the mean percentage. The result revealed that there was generally poor performance. The mean performance scores on numeracy test was 32.2%. Osagie & Ehiamezor (2010) carried out a study on assessment of learning achievement of primary four pupils in Edo State. The finding revealed that the scores on numeracy test showed a general poor performance with an average performance of 33.64%. The Kwara State Ministry of Education and Human Capital Development (2011) gave it annual education sector performance report. Public primary school 2 and 4 pupils were tested in Mathematics. The

results obtained in Mathematics reveals that 42.00% of the primary 2 pupils sampled responded correctly to questions raised on counting, addition and subtraction, fractions and shapes while 34.00% of primary 4 pupils sampled responded well to roman numerals, division /square root, LCM and area. National Population Commission, Nigeria and RTI International (2011) reported Nigeria DHS EdData Survey 2010 national literacy, reported that the Nigeria DHS EdData Survey 2011 national numeracy was 58.00% for children aged 5 to 16 years of those who can correctly sum numbers.

Furthermore, assessment and evaluation of UBE programme in Nigeria were subjected to several national assessment exercises since it was launched in 1999. The Universal Basic Education Commission (UBEC) conducted National Assessments on Learning Achievement especially in 2003, 2006, 2011 and 2013. The Federal Ministry Education (2013) also assessed achievement of primary 4, 5, 6 pupils and students in JSS 1 in English Language and Mathematics. For instance, the performances of pupils in Mathematics were Primary 4 (51.63%), Primary 5 (50.36%) and primary 6 (52.94%).

In another development, the Rivers State Ministry of Education (2013) researched on Monitoring of Learning Achievement (MLA) in Rivers State public schools. At the primary level, it revealed that mean score in numeracy was put at 49.60%. The National Population Commission and RTI International (2016) reported the 2015 Nigeria education data survey (NEDS) conducted and it revealed a mean score of 73.6% in numeracy.

Statement of the Problem

All the studies that examined critical thinking combined other variables such as students' academic achievement and misconceptions about psychology; student teachers' scientific process skills; students' educational achievement; academic achievement. However, none of the studies combined numeracy as one of the variables and most importantly the targeted audiences were students of secondary and tertiary institutions. Critical thinking has not

been examined at the lower level of education as highlighted by the National Policy on Education (2013). Hence, the study correlates critical thinking and numeracy learning outcome at the middle basic level of education in Kwara State, Nigeria

Purpose of the Study

This study is guided by the following research objectives:

1. investigate the mean level of critical thinking among pupils of middle basic schools in Kwara State Nigeria.
2. determine critical thinking as a correlate of numeracy learning outcome among middle basic pupils in Kwara State, Nigeria.

Research Questions

1. What is the mean performance in critical thinking among middle basic pupils in Kwara State Nigeria?
2. What is the mean performance in numeracy learning outcome among middle basic pupils in Kwara State Nigeria?

Research Hypothesis

H_{01} : There is no significant correlation between critical Thinking (Quantitative Reasoning) and numeracy learning outcome among middle basic pupils in Kwara State, Nigeria.

Methodology

Descriptive survey of correlation type was adopted for this study. It correlated critical thinking with numeracy learning outcome. Universal basic schools in Nigeria comprised three levels (i.e. Lower, middle and upper) basic and that of Kwara State is not an exception and the programme is 9 years, 3 years for each level. The population for this study therefore, comprised 299,546 basic pupils (Primary 1 to 6) in both public and private schools in Kwara State (Kwara State Ministry of Education and Human Capital Development, 2019). This population was therefore, stratified into 202,015 pupils in public schools and 97,531 pupils in private schools in the state. The target population comprised pupils in middle basic

(i.e. primary six) with 27,799 in public and 2,713 in private schools (Kwara State Annual School Census Report, 2018).

The state has three senatorial districts (i.e. Kwara Central, North and South) which have 16 Local Government Areas (LGAs) in all. Kwara Central comprised Asa, Ilorin East, Ilorin South and Ilorin West LGAs); Kwara North comprised Baruteen, Edu, Kaima, Moro and Patigi LGAs) while Kwara South consisted of Ekiti, Ifelodun, Irepodun, Isin, Offa, Oke-Ero and Oyun LGAs. Two LGAs were sampled from each senatorial district using simple random sampling technique. This amounted to six LGAs sampled in the state. In each LGA sampled, the existing number of primary schools (public and private) was listed and 10 percent of them were sampled using simple random sampling technique. In any school visited, 30 pupils in basic six were sampled using simple random sampling technique. In all, 54 and 26 public and private schools respectively were sampled. In the course of data collation and entry, it was discovered that some of the questions were not answered in QRS and NPT therefore, those scripts were discarded. This reduced the sample size to 2,315 pupils.

The researcher employed two data collection instruments: Quantitative Reasoning Scale (QRS) and Numeracy Performance Test (NPT). Each of the instruments contained twenty (20) items. The first instrument (QRS) has three sub-sections which tested higher order thinking skills such as analyzing and evaluating. The first two categories (analyzing and evaluating) had seven items each while the last level (creating) has six items. The instrument was constructed in form of multiple-choice items with four options (A–D) and the outputs were transformed to percentage for easy computation.

The second instrument (NPT) has four sub-sections viz: Number and Numeration, Algebraic Processes, Geometry and Mensuration and Statistics and Probability. These are sub-themed in the Mathematics National curriculum that national curriculum was based. The second instrument was also constructed in form of multiple-choice items with four options (A–D) and the outputs were also transformed to percentage for easy

computation.

For the two instruments, Content Validity (CV) via Item Level Content Validity Scale (S-CVI) was computed. Seasoned classroom teachers were used as raters to ascertain that those items addressed the identified thinking skills and the curriculum content for QRS and NPT respectively. Those responses were computed and obtained Content Validity of 87.6 for QRS and 92.5 for NPT.

Reliability estimate was computed on the two instruments. This was carried out in two steps. The first step was the computation of item analysis which primarily focused on the item-level information. This determines the desired

quality of test items via item difficulty and discrimination. The second step was the computation of reliability estimate itself. Test of split-half reliability was adopted. Kuder Richardson KR 20 formula was employed and obtained reliability coefficient of KR 0.76 and 0.88 for QRS and NPT respectively. Percentage mean was used to answer the two research questions raised. Statistical Package for Social Science Window Version 23.0 was to analyse the data collected.

Method of Data Analysis

Research Question 1: What is the mean performance in critical thinking among middle basic pupils in Kwara State Nigeria?

Table 1: Distribution of Respondents Based on Critical Thinking Level

Critical Thinking	Score Range	Frequency	Percentage (%)
Low	0–33	776	33.00
Average	34–66	1220	51.89
High	67–100	355	15.11
Total	0–100	2351	100.00
Mean Performance	44.61%		

Results in Table 1 reveal the critical thinking of the sampled pupils. It shows that 776 (33.00%) had low critical thinking level, 1,220 (51.89%) were in average level while the rest 355 (15.11%) had high critical thinking. This

implies that the mean performance of pupils' critical thinking was put at 44.61%.

Research Question 2: What is the mean performance in numeracy learning outcome among middle basic pupils in Kwara State Nigeria?

Table 2: Distribution of Respondents Based on Numeracy Learning Outcome Level Obtained

Level of Thinking	Score Range	Frequency	Percentage (%)
Low	0–33	407	17.31
Average	34–66	1,528	64.99
High	67–100	416	17.70
Total	0–100	2,351	100.00
Mean Performance	52.42%		

Results in Table 2 reveal the performance of pupils in numeracy. It shows that 407 (17.31%) had low-level of numeracy, 1,528 (64.99%) were at average level while the rest 416 (17.70%) had high level. Going by the mean score computed, the pupils sampled obtained a mean score of 52.42% in numeracy.

H_0 : *There is no significant correlation between critical Thinking (Quantitative Reasoning) and numeracy learning outcome among middle basic pupils in Kwara State, Nigeria.*

Table 3: Correlation between Critical Thinking Numeracy Performance

creativity and *enhances lifelong learning*. It was concluded from that there was a high and positive significant correlation between critical thinking and numeracy learning outcome. Hence, the following recommendations are put forward in the course of this study:

1. Examiners (internal and external) should try as much as possible to prepare questions that will require the testees to use higher thinking abilities in solving numeracy tasks both at the terminal and at the end of session. This might develop pupils' potentials in tackling issues and enhances high level of learning outcomes.

2. Pupils need to develop reflective thinking. This might allow them to have good memory to synthesize different ideas and recall facts quickly to solve mathematical concepts to solve daily issues.

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Table 3: Correlation between Critical Thinking Numeracy Performance

		QRS	NPT
QRS	Pearson Correlation	1	0.841**
	Sig. (2-tailed)		.000
	N	2,351	2,351
NPT	Pearson Correlation	0.841**	1
	Sig. (2-tailed)	.000	
	N	2,351	2,351

****Correlation is significant at 0.05 level (2-tailed)**

Table 3 reveals the result of correlation between critical Thinking (Quantitative Reasoning) and numeracy learning outcome among middle basic pupils in Kwara State, Nigeria. The coefficient r-value is 0.841 computed at 0.05 level of significant. Since computed sig. (0.00) at 2-tailed is less than the chosen sig. (0.000) shows that the hypothesis is rejected. This implies that there is a positive and high significant correlation between quantitative reasoning (critical Thinking) and numeracy learning Outcome which is symbolically written as $r_{(2,349)} = 0.841, P < 0.05$.

Discussion of the Findings

Findings of this study revealed that, mean performance in critical thinking ability was 44.61%, which is below average performance. The level of critical thinking found suggests that pupils relied on the reproduction of knowledge rather than having the opportunities to construct in a given task especially in academic work. The finding is in contrary to the assertion of Nordin & Dakwah, (2015) who found that more of the students sampled obtained 65.1% critical thinking using Watson Glaser Critical Thinking scale. Differences in the findings could be attributed to differences in the instrument used in the study (Quantitative Reasoning) used to evaluate critical thinking and the one used by Nordin & Dakwah in 2015 was Watson Glaser Critical Thinking scale. Differences in findings could also be attributed to locale; the present study was carried out in Kwara State, Nigeria while Nordin & Dakwah, (2015) carried out their study in Pahang Islamic College, Sultan Ahmad Shah, Kuantan, Malaysia. Another

reason could be the level of education at which the studies were carried out Nordin & Dakwah, (2015) studied students in secondary school while the present study was carried in primary school.

This study revealed that there was a positive and high significant correlation between Quantitative Reasoning (Critical Thinking) and Numeracy Performance (Learning Outcome). This suggests that the higher the critical thinking ability of the pupils, the higher would their performance in numeracy test. This implies that pupils that possess higher level of critical thinking skills tends to have better capabilities of utilizing and processing, organizing, understanding information properly. Hence, have a good performance in any academic tasks.

It must be mentioned that literature reveals that there has been inconsistency in the findings generated by the earlier scholars. For instance, the finding of Taghva, Rezaei, Ghaderi & Taghva, (2014) revealed that there was a significant relationship between teachers' critical thinking and students' educational achievement. In the same vein, Nordin & Dakwah, (2015) finding revealed that there was no correlation between Islamic Studies students' critical thinking level and their academic achievement (measured by CGPA).

Conclusion and Recommendations

Critical thinking skill is a significant factor that can influence learners' learning outcomes. When pupils think critically in their academic work, there is likelihood that it might boost

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Assessment of effectiveness and impact of agricultural youth empowerment scheme training programme in Lagos State, Nigeria

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Abstract

Despite Nigeria's rich agricultural resource endowments, the agricultural sector has been growing at a very low rate. This has led to the gross unemployment and food shortage especially in a densely-populated state like Lagos. One of the proactive initiatives to salvage this situation is the establishment of the Agric-Youth Empowerment Scheme (Agric-YES) programme which involves training of participants in basic agricultural skills in the state to empower them and increase agricultural produce. However, effort geared towards assessing the effectiveness of government programmes in Lagos State is yet to be extended to the Agric-YES; hence the reason for this study. The study is an expo-facto type with total population of all trainees in Agric-YES programme. Purposive sampling was employed to select 100 trainees of Agric-YES Programme from 2009/2010 – 2015/2016 sessions. The data collection instruments are Standard of Living Scale ($r=$), Farm Training vocational skill Scale ($r=$). The data collected was analysed using paired t-test and the result reveals a significant improvement in basic knowledge of Agriculture ($t(98) = -13.52, p < 0.05$), trainee vocational skill ($t(98) = 14.17, p < 0.05$), and trainees' standard of living ($t(98) = -30.81, p < 0.05$) when compared with their initial status before the programme. The result reveals that Agric-YES programme has bettered the lives of beneficiaries, It is then necessary for the stakeholders at different levels to focus on sustainability of the programme.

Word Count: 241

Key words: Standard of living, Vocational skills, Empowerment, Training

Background to the Problem

Despite Nigeria's rich agricultural resources endowments, the agricultural sector has been growing at a very low rate. Less than 50 percent of the country's cultivable agricultural land is under cultivation (FMARD, 2001). Smallholder and peasant farmers, who make use of crude tools and implements and who produce through rudimentary production techniques cultivate these lands and upon their lack of access to modern implements and inputs, experience low yields in their farm enterprise (FMARD, 2012). Nigeria has therefore become heavily dependant on food importation due to low agriculture productivity that is unable to make food available for the teeming population. At Present, the population of Nigeria is about 200 million which is the largest in Africa and it accounts for 47 percent of West Africa's total population (United Nations, 2019). The proportion of population in the developing world is directly or indirectly connected with agriculture. The World Bank reported 2.5 billion people that depend on agriculture as their main source of livelihood and among them 1.3 billion people are small farmers who do not own land. About 75% of all world poor people live in rural areas

and 80% of them are in agricultural sector for their livelihood (Evaluation Cooperation Group, 2011). Unemployment remains a significant problem with an estimated 50 million youths unemployed. There is therefore, threat to hunger, poverty and food insecurity as not less than 70% of Nigerians live on less than #100 or US\$ 0.7 per day (Oni, 2008).

The problem of food shortage is especially critical in Nigeria as about 90% of Nigeria's agricultural output comes from inefficient small number of farmers. Most of these farmers do not even have enough food to feed their own families. This challenge becomes greatest in the developing countries especially in Nigeria where people starve for lack of adequate food and nourishment and where starvation, hunger and poverty go hand in hand. Agriculture is core to every nation's development especially in this 21st century; hence, it becomes imperative to give agriculture a place of priority in nation building. Okpanachi (2004) shares the same opinion as they state that if agriculture is stagnant, it offers only a stagnant market and inhibits the growth of the rest of the economy.

Nigeria should consider Agriculture as the gateway to several desired ends which include poverty reduction, rural transformation, employment, food security, and improved national health profile of the Nigerian citizenry.

Availability of food is a human rights issues and it is fundamental to the development of any nation. Therefore, quest for food availability is a mandatory responsibility of any country. Lucas (2007) claims that in the modern world, no nation can truly be great if it cannot feed her populace and no meaningful progress can be made in other sectors of life if there is scarcity of food for the people. This is one of the main reasons why Nigeria embarks on many of her agricultural initiatives and developmental policies in order to reverse the situation of food shortage. In the past, various efforts and methods have been employed in order to address the problems of food shortage in the country. The appraisal on the past shows that successive administrations in Nigeria had initiated programmes towards ensuring that food is available and accessible for the teeming population. The sustenance of the idea to fulfill her mandate has remained a dream. The first agricultural programme was National Accelerated Food Production Programme (NAFPP) by Gen. Yakubu Gowon; which was aimed at boosting farmer's productivity, income and living standard (Obasi, 2013). The failure of this programme led to the birth of Agricultural Development Project (ADP) in 1975, which is more comprehensive in nature. Agricultural Development Project focused on the rural areas, while other functional agricultural programmes were also initiated, such as Operation Feed the Nation in 1976 by Muritala/Obasanjo administration and Green Revolution in 1980. These programmes, as a group, were established to improve the capacity of local production and reduce importation of food (Nzechi, 2006).

However, the policy shifted focus from the issuance of various types of subsidies and incentives to farmers and citizenry alike meant to boost food production to non - agricultural programme. The goals of the programmes thus became just a mirage based on the results according to (Shimada, 1999). This was due to

the ad-hoc nature of planning and principally bad governance. Green Revolution was to strengthen the self- sufficiency in food production. This plan was to be achieved through partnership with agencies such as ministries of Agriculture, Water Resources; Labour and Commerce; the River Basin and Rural Development Authority and Agricultural Development Project (ADP). The Directorate for Food, Road and Rural Infrastructure (DFRRI) was of more rural roads rehabilitation than food production.

Many of these initiatives were not successful because they were ad-hoc programmes that lacked focus. They were poorly conceived and implemented and were duplicates of already existing programme and organisations (Fasoranti, 2006). In addition, government policy was inconsistent and projects were improperly monitored and implemented (Okafor, 2004). Also, in existence was an unfriendly macro-economic policy environment characterized by an overvalued exchange rate, a mismanaged subsidy regime and bad export crop pricing schedules (Adewuyi and Okunmedewa, 2001). The environment encouraged imports at the expense of local crops, which led to crowding out of local production (Muhammed- Lawal and Atte 2006). Several food crops (particularly tuber) were also neglected in favour of cash crops, while government invested very little funding in support of agricultural related research. In addition, the Marketing Board, which is exclusively used to handle trade and export of agricultural produce, was abolished. Agriculture has also been constrained by numerous challenges like agricultural policies in Nigeria; low fertilizer use; low access to agricultural credit; land tenure insecurity; land degradation; poverty and gender issues, low and unstable investment in Agricultural research, poor market access and marketing efficiency; staple crops varieties, poor resistance to drought, pest and diseases; high cost of agro chemicals and poor storage facilities.

Other recent works by United States Agency for International Development Report (2007), Joint Field Evaluation Survey conducted by the

National Agricultural Extension and Research Liaison Service (NAERLS), the Federal Department of Agriculture and National Food Reserve Agency (NFRA), (Ihaji, 2004; Ortese, 2004; Abachi and Salamat, 2004; Okpanachi, 2004; Ukase, 2007; Jabara, 1988; Gokum, 2007) all in Ogiji (2007) have revealed other constraints of agricultural productivity in Nigeria to include poor conceptualisation and inefficient implementation of programmes; early cessation of rainfall after several interruption during the season which causes significant crop losses and reduces yields; poor rural roads and attendant high transportation cost; the increasing unattractiveness of the agriculture and rural sector to the youths who rather flock to cities for white collar' jobs; the continued dependence on subsistence farming; the cultural structure of communal living and inter dependence which causes unwholesome burden to the working populace; ethnic and communal conflicts; farmers misplaced priorities of investable funds to unproductive areas like offsetting debts, building more houses, marrying more wives, the complete disregard of farmers by government in the formulation of agricultural policies, farmers educational low profile; the devastating effect of avian influenza (Bird flu) in poultry industry which led to a drastic fall in demand for poultry products and prompted a decline in the production of maize; and bad governance being at the fulcrum of all.

Available evidence in Africa suggests an ageing farming population ranging for instance, between the ages of 47 and 75 years and a high unemployment rate of youths in Nigeria (Apan, 2010). Involvement of youths in agricultural activities has the potential of reducing the problems of the ageing farmer population and increasing youth unemployment. This calls for securing the interest and participation of young people in agriculture in form of deliberate shift in policy, training and promotion that specially target the youth. This category of people is not only the productive backbone of every society, but also the major source of ideas and innovation, the main market for food consumption and very often are the leaders and drivers of public opinion, public policy and action. The youthful

stage of life is very important in determining young people's paths to achieving productivity, employment and decent lifestyle. They are energetic and capable of learning and maintaining skills that can make their communities and the nation to flourish. Youths are risk takers and more likely to have access to extension services and make use of agriculture loans more effectively (Amaze and Tashikalma, 2003). They are capable of developing the attitude, knowledge and skills that make them to undertake active functions in the society and collaborate with adults to tackle serious issues of life (Gobeli, 2004). Gwary, Kwaghe, Jaafar-Fura and Dennis (2011) gave some of the possible agricultural occupations which offer opportunities for entrepreneurial skills for youth in Nigeria. These are food crop production, livestock production, orchard management, aquaculture (fish farming) mechanization, marketing, processing and distribution and forest jobs. Youths' involvement in agriculture provides them with economic benefits and means of self-reliance.

There is a problem of food shortage in Nigeria as a whole and Lagos-State is not exempted. As a measure to mitigate this problem, a number of food production programmes was put in place such as Rice for job at Imota Ikorodu, Vegetable farming at Badagry, Piggery farm at Oke -Aro, Fish farming at Odogunyan in Ikorodu and recently, we have Agriculture Youth Empowerment Scheme at Epe. The Agriculture –based Youth Empowerment Scheme (AGRIC-YES) was conceptualised as a form of social intervention aimed at solving the twin problems of youth unemployment and food production. Agriculture –based Youth Empowerment Schemewas, therefore, introduced as a special intervention scheme for the reduction of unemployment among youths, restore dignity to agriculture, as well as, contribute to food security in Lagos State by engaging youths in modern and advanced agricultural production methods. The policy is to take young people, especially young graduates away from the allurements, clamor and desperation of seeking and looking for jobs that do not exist and to bring them back to the foundation of the earth i.e. to bring them back to land (Babatunde, 2013).

The mission of the scheme is to engage, equip, and empower youths with resources to become world – class agro- entrepreneurs with a view to becoming new generation of agro-entrepreneurs, create employment and food production in Lagos State. The project which took off on October 2, 2009 is the actualization of a ten-point agenda to create wealth, ensure food production and alleviate poverty through entrepreneurial training in agriculture and achieve the vision to further key Lagos State into the Millennium Development Goals which is now translated to Sustainable Development Goals and the World Bank Social Protection Strategy. Agriculture Youth Empowerment Scheme has much to offer, but the unskilled youths need to be trained or given some amount of basic skills on how to be better farmers than their ancestors, if youths are to serve themselves and the nation in their fullest capacity.

The Agriculture-Youth Empowerment Scheme training programme is an institution organized by Lagos State government in conjunction with Ministry of Agriculture and Cooperatives, which is designed to offer technical and vocational education. The technical and vocational training is an aspect of education designed to provide technical knowledge and vocational skills necessary for agriculture, commercial and economic development; and give training and impart the necessary skills to individual for self- reliance economically (FRN, 2013). The specific objectives of Agriculture Training Institute as stated in Agriculture-Youth Empowerment Scheme hand book (2008) are to:

1. To equip and empower the beneficiaries of the programme.
2. To contribute to food production and, thus, food security.
3. To keep the youths off the streets by channelling their abundant energy towards productive agricultural ventures, thereby minimizing the crime rate in the society.
4. To improve the standard of living of youths through self- sufficiency in agro-based enterprises, as well as, becoming employers of labour.
5. To make agriculture more attractive for

the target youth thereby producing elite farmers in the areas of poultry, aquaculture, piggery, crop (Arable and vegetable) production.

6. To provide employment opportunities for the new generation of young farmers. Agric-Yes farm is saddled with the following functions;

1. Buyer of last resort to Agric-yes farmers' state-wide.
2. Training and Human Capacity Development in cutting edge agriculture production these include
 - i. Short Courses in specialized areas of production
 - ii. Refresher programmes for already practicing farmers.
 - iii. Initiation into Commercial Farming for Serving and Retiring Civil Servants.
3. Provision of logistic support for proposed Satellite Settlement and Commercial Farmers around Lagos State.
4. Research and Development: This unit is to develop locally know-how and Agro- Technology, which will enable profitable and advanced agricultural production both at Training Farm and at Farmer's Level.

There is need to ascertain the effectiveness of Agriculture –Youth Empowerment Scheme with respect to the objectives it was designed to achieved.

Statement of the Problem

The greatest problem confronting the world today is how to eliminate hunger and overcome poverty in our society. This challenge becomes the greatest in the developing countries where people experience starvation for lack of adequate food sufficient for nourishment. People in Nigeria, like others in Sub-Sahara Africa and South-Asia remain the poorest in the world. Poverty related problems in Nigeria dated back to the country's independence in 1960. The most disturbing fact is that instead of decreasing, the problem has become complex in the last few decades. One of such scheme to ameliorate such deplorable situation is the introduction of Agricultural Youth Empowerment Scheme.

Agric-YES was implemented to reduce unemployment, restore dignity to agriculture, empower youths socially for a sustainable livelihood and at the same time, boost food production through entrepreneurship education in Lagos State. Several studies on Agric-YES programme concentrated on the contribution of Agric-Yes to youth involvement in Agriculture, job creation, innovation and resource allocation, but there is a little attention on the evaluation of entrepreneurship training and education towards food production and reduction in poverty in Agric-Yes immediate environment. Hence, this study assessed the effectiveness of training aspect of Agric-YES programme in Lagos State with respect to acquisition of basic knowledge of agricultural and vocational skills and corresponding change in standard of living of the trainees.

Research Questions

1. To what extent has the Agriculture - youth empowerment scheme equipped their beneficiaries with basic knowledge on Agriculture?
2. To what extent has the Agriculture - youth empowerment scheme equipped their beneficiaries with vocational skills?
3. To what extent has Agriculture - youth empowerment scheme contributed to improve the standard of living of the beneficiaries?

Methodology

Research design

This study adopted non- experimental survey research type of quantitative method of data collection.

Population

The population for this study was made up of current and graduate trainees of the Agricultural Training institute for Agriculture Youth Empowerment Scheme, in (ATI) Araga-poka, Lagos, Nigeria.

Sampling Technique and Sample

Purposive was employed to select trainees of Agriculture Youth Empowerment Scheme from 2009/2010 – 2015/2016 sessions. Total enumeration approach was adopted to obtain one hundred trainees that are current participants and two hundred (200) graduates of the training programme for the study.

Research Instrument

Three instruments were used for data collection activities in the study Agricultural Science Achievement Test (ASAT, $r=0.81$), Vocational Skill Test (VST, $r=0.81$) and standard of living questionnaire (SLQ, $r=0.89$). The Agricultural Science Achievement Test (ASAT) and Vocational Science Test (VST) were drawn from the West African Examination Council (WAEC) past questions using table of specification to draw the questions under consideration. The vocational Science Test was inform of Agricultural Science Practical test which was used to ascertain the level of Vocational skill acquired by each trainees. The questions were given to trainees and responses scored. The score was transformed using transformation formular $T=10Z+50$ in order to make room for comparison before and after the training programme. Standard questionnaire was given to graduates to assess their level of income so basically to compare their standard of living before and after the training programme.

Validation of Instruments

All the instruments were validated by seeking the opinion of experts and reliability of the items was established using Kr-20 formula.

Data Analysis

Data collected were subjected to multiple regression analysis using (SPSS) at 0.05 level of significant.

Result and Discussions

Research Question 1

To what extent has the Agriculture - youth empowerment scheme equipped their beneficiaries with basic knowledge on Agriculture?

Table 1: Difference in Trainees' Basic Knowledge of Agriculture before and After the Training

Variables	N	Mean	Std. deviation	df	t	Sig	P	Remark
Before the Training	100	55.95	0.719	99	-13.52	0.00	0.05	significant
After the Training	100	57.24	1.24					

Paired t-test was used to compare difference in mean improvement basic knowledge of agriculture before and after the trainees' engagement. Significant mean improvement was found $t(df=98)=-13.52, p>0.05$. The result revealed that mean basic knowledge of agriculture after the engagement (mean =57.24, S.D=55.95) was significantly higher than their basic knowledge before the engagement (mean

=55.95, S.D=1.24). Therefore, from the result of the analysis there is no statistical reason why Agric-YES programmes do not equip participants with basic agricultural knowledge.

Research Question 2

To what extent has the Agriculture - youth empowerment scheme equipped their beneficiaries with vocational skills?

Table 2: Difference in Trainees' Vocational Skills before and After the Training

Variables	N	Mean	Std. deviation	df	t	Sig	P	Remark
Before the Training	100	56.30	0.85	99	14.17	0.00	0.05	significant
After the Training	100	58.24	1.24					

Difference in trainees' vocational skill before and after Youth Empowerment scheme was examined using paired t-test, The result reveals a significant difference in mean ($t(100)=-14.17, p>0.05$) which implies that mean vocational skills of the trainees after the empowerment scheme (Mean=58.24, $p<0.05$) was significantly higher than mean vocational skills before empowerment scheme (Mean=56.30,

SD=0.85). Hence, it could be said that Youth Empowerment scheme equipped beneficiaries with vocational skills.

Research Question 3

To what extent has Agriculture - youth empowerment scheme contributed to improve the standard of living of the beneficiaries?

Table 3: Change in Beneficiaries Standard of Living of Agric-YES Due to Empowerment Scheme

Variables	N	Mean	Std. deviation	df	t	Sig	P	Remark
Before Empowerment	200	25177.66	7395.11	199	-30.81	0.00	0.05	significant
After the Empowerment	200	43604.06	7673.54					

Table 3 show the Paired t-test result for the different between beneficiaries' standard of living before and after the empowerment scheme. The result reveals a significant improvement in their standard of living ($t(df=195)=-30.81$). This implies that mean income of beneficiaries after the empowerment (Mean=43,604.06, SD=7673.54) was significantly higher than mean income (Mean=23,177, SD=7395.11) before the empowerment. Hence, inference could be made that there is increased standard of living of the beneficiaries.

Discussion

Table 3 presents the result of the analysis on change in trainees' basic knowledge of Agriculture due to participation in training aspect of Agric-YES programme. The result reveals that there was significant increase in trainees' basic knowledge of Agriculture after the end of the programme. This is an indication that the training received by the participants was effective and made impact on participants. This result is in alliance with other findings in literature such as that reported by Bassey and Inyang (2001) who observed that training facilitates and improves trainees' skill acquisition which will bring about expertise and versatility in future engagement. Nwobasi (2011) was also of the opinion that Agriculture training programme should equip participants with entrepreneurial skill such as ability to identify a particular disease, construct ridges, building of poultry house or maintaining the existing ones. The establishment skill is the ability of a trainee to identify a good site, select best soil and procure the necessary input for

farming activities.

Table 2 also presents the result on change in trainee vocational skills due to participation in the training aspect of Agric-YES programme. The result reveals significant change in trainees' vocational skills which is ample evidence that the training had impacted the vocational skills of the participants and also proved effective among the beneficiaries. This acquired skills is important especially at this period when the wide spread realisation among stakeholders in Agriculture is the need to encourage entrepreneurship development, especially among the growing population, as a way of tackling the unemployment problem. (Obinna Chima 2017) and the skills acquisition that will lead to reduction of crime rate, unemployment and poverty in the society.

Results from Table 3 shows the change in trainees' standard of living with respect to participation in the training aspect of Agric-YES programme. From the result, a significant increase in standard of living of participants was observed. This is an indication that participants in the programme have their economic status improved with the corresponding improvement in their standard of living. The result also served as a pointer that the beneficiary communities must have been impacted by the programme. The result also confirms the fulfilment of one the objectives of Agric-YES programme at the state and national level as it was documented that Agricultural education should lead to development of appropriate skills, mental, physical and social abilities and competencies to empower the individual to live and contribute

positively to the society (FRN, 2013).

Conclusion

Based on the result of the analysis and the discussion of findings, it could be concluded that training aspect of Agric-YES have enriched the knowledge of the participant with respect to basic agricultural concept, improved their entrepreneurial skills as well as their social status in the community. Thus, it could be inferred that training aspect of Agric-YES programmes have proved effective in the study area.

Recommendation

Based on the conclusion of the study, it was recommended that;

- stakeholders in Agric-YES programme in both federal and state level should replicate the programme all over the state in the federation.
- Again, the resources that will enhance the training on the side of the trainers and the trainees should be supplied to enhance the sustainability as well as effectiveness in the subsequent training session.

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Influence of Spousal Support on the Quality of Life of Women Living with Breast and Gynaecological Cancers in Ibadan, Nigeria

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Abstract

Breast and gynaecological cancers are the commonest cause of death among females (Inoue-Choi, Robien, & Lazovich, 2013). This research was conducted to establish the influence of spousal support on Quality of Life (QoL) of Women Living with Breast and Gynaecological Cancers (WLWBGCs) in a Nigerian tertiary hospital. The study used descriptive cross-sectional design to study 160 WLWBGC purposively selected from the Radiation Oncology unit and the Surgical Outpatients Clinic of the hospital. A structured questionnaire was used to collect relevant data from the participants after obtaining ethical clearance and consent form. The data were analysed using descriptive (mean, standard deviation, and frequency/percent), and inferential statistics (Chi-square) with the aid of Statistical Package for Social Sciences (SPSS) software. The level of significance was taken to be 0.05. The women's QoL was due to the fact that more than half of their population experience poor physical, emotional, social, sexual and spiritual life. Although some of the women received emotional, informational and instrumental support from their spouses, the spousal supports provided did not significantly improve their QoL ($X^2 = 2.880$, $p-v = 1.113$). Therefore, since spousal supports did not influence the QoL of WLWBGCs, further studies focusing on improving the QoL of this category of women is therefore recommended.

Keywords: Spousal Support, Quality of Life, Breast cancer, Gynaecological, Women

Introduction

Cancer belongs to the class of diseases that impact severely on the physical health as well as the emotion of the victims (Chittem, 2014). The disease actually disturbs human's daily physical activities, career and social life (Ozkan & Ogce, 2008; Ozkan, Ogce, & Cakir, 2011; Banovcinova, & Baskova, 2016). Diagnosis and treatment of cancer leads to long-term worsened QoL in cancer survivors (Stanton, Rowland, & Ganz, 2015). Besides, the diagnosis and treatment procedures synergy affects the QoL of the women. Social support has been viewed as promising solution to the potential associated poor QoL of the patients (Bodenmann, 2011; Badger, Segrin, Hepworth, Pasvogel, Weihs, & Lopez, 2013).

Specifically, breast and gynaecological cancers are the most common cancers in women worldwide having 2.4 million new cases per year (Afolayan, Ibrahim & Ayilara, 2012).

Cancer of breast remains the most common cancer in women, while gynaecological cancers come second. Gynaecological cancers include cancers of the cervix, ovary, vagina, vulva, uterine body, and fallopian tubes (Ferlay, Shin, Bray, Forman, Mathers, & Parkin, 2010). Other gynaecological cancers include ovarian, endometrial, and choriocarcinomas (Akinde, Phillips, Oguntunde & Afolayan, 2015).

The diagnosis and treatment of breast and gynaecological cancers disrupts women's functioning ability in a number of ways. This is due to the fact that the diagnosis of breast and gynaecological cancers is a distressing event that affects the physical, psychological functioning, lifestyle and relationships with family and friends (Bloom, Stewart, Oakley-Girvan, Banks, & Shema, 2012). Social support was also shown to be very important in the prevention of anxiety, depression, and other psychological problems, which are commonly

observed in cancer patients. Women therefore need support when coping with the stress associated with the diagnosis and treatment of cancer (Friedman, Kalidas, Elledge, Dulay, Romero, Chang, & Liscum, 2006).

Studies have found that social support is associated with better adjustment to disease and better quality of life (Schulz, & Schwarzer, 2004; Cotter & Lachman, 2010). However, the subjective appropriateness of the support offered is important, especially the one that is received from a soulmate like the spouse (Cotter & Lachman, 2010). However, the QoL which is the extent to which one's usual or expected physical, emotional, social, spiritual and mental well-being is affected by the individual's medical condition is a multi-dimensional concept that defines the person's view and satisfaction with life (Arriba, Fader, Frasure, & Von Gruenigen, 2010). Spouses are regarded as the key sources that play major role within the social network for married women who are living with reproductive system cancers (Schwarzer, Knoll & Rieckmann, 2014). The extent to which a woman's functioning ability is disrupted during stressful situation varies with a number of factors, including the support she receives from her intimate partner (Schwarzer, 2014). The extension of the spousal's emotional support (expression of positive effect, empathic understanding and the encouragement of expressions of feelings, for example, sharing of most private worries and fears), instrumental support (offering of material aid or behavioural assistance, for example, helping in house work) and informational support (offering of advice, information, guidance, or feedback that can provide a solution to a problem, for example, offering suggestions about how to deal with a personal problem) that the women living with these cancers receive can improve their coping attempts thereby, improving the quality of life of these patients (Schulz, & Schwarzer, (2004).

Statement of Problem

Breast and gynaecological cancers kill more women than any other diseases worldwide. Apart from the associated mortality, the quality of life (QoL) of cancer patients is possibly going to be adversely affected. It is believed that the

QoL of women with gynaecological cancer is likely to determine their coping and life expectancy. Their diagnoses cause cumulate into greater distress in female patient than any other diseases. Breast and gynaecological cancers affect the reproductive organs which are very critical to marital affairs such as sexual needs, enjoyment and satisfaction. Thus, it can cause frictions in families as well as impairing needed social supports from spouses.

Akso,, due to the fact that complications of cancer disease potentially interfere with the quality of daily activities of the women, it makes the issue of studying their QoL a worthwhile task. Therefore, this study was designed to examine the influence of spousal support on the participants' QoL. There was no evidence of breast and gynaecological cancers in Nigeria either from statistics or literature to make the study worthwhile and enhance knowledge.

Objective of the study

1. To describe the socio-demographic characteristics of the participants
2. To assess the quality of life of the women living with breast and gynaecological cancers
3. To examine the spouses' support for their partners (WLWBGCs)
4. To describe the level of perceived spousal support received by WLWBGCs

Research Questions

1. What are the demographic characteristics of the participants?
2. What is the quality of life of the women living with breast and gynaecological cancers?
3. What is the level of spousal support to their partners (women) living with breast and gynaecological cancers?
4. What is the level of perceived spousal support received by women living with breast and gynaecological cancers?

Hypothesis

1. There is no significant relationship between the level of spousal support provided and the quality of life of women living with breast or gynaecological cancer.

Methodology

The study employed a descriptive correlational design to establish the variance in the QoL of those WLWBGCs who received adequate spousal support, and those who received inadequate spousal support. A total of 160 WLWBGCs attending the Radiology Oncology, and the Surgical Outpatient Clinic of the University College Hospital, Ibadan (UCH), Ibadan were recruited for the study.

Target Population

The target population was the women that were diagnosed and were undergoing treatment or treated for breast and gynaecological cancers in the University College Hospital.

Study Population

The study population was the WLWGCs that were attending the Radiology Oncology and the Surgical Outpatients clinics at University College Hospital, Ibadan. The married WLWBGCs, who were still living with their spouses as at the time of collection of the data, were included in the study. WLWBGCs but who were critically ill at the time of data collection were excluded from the study.

A 4-sectioned structured questionnaire was designed for data collection. Section A elicited the participants' socio-demographic variables, while section B was 23-items adapted from European Organization for Research and Treatment of Cancer's QoL; version 30 (Aaronson, Mattioli, Minton, Weis, Johansen, Dalton, & de Boer, 2014). Each item was answered on a three-point scale, ranging from "Not at all" to "Always". The scores range from 0 to 3. Section C contains 20 items which assessed spousal support available to the participants. This section was adapted from the Social Support Scales (SSS), (Schulz, & Schwarzer, 2004). Responses to each item were scored on 3-point scale, ranging from 0 = "Never" to 3 = "All the time".

The questionnaire was translated by a translator expert to Yoruba language using back-to-back translation for participants who could speak

Yoruba language only. The instrument was validated by experienced researchers, gynaecological oncology experts, and statistical analyst following their expert review. The reliability of the instrument was ensured via a pilot study method. Thus, the reliability coefficient of the instrument was 0.9.

Ethical Considerations

Ethical clearance for the study was obtained from the UI/UCH Ethical Review Committee. Written informed consent was obtained from each participant prior to data collection. Participation in the study was made voluntary. Participants were neither coerced nor exposed to any harm. To ensure confidentiality, participants were attended to privately and the questionnaire did not reflect their names and addresses.

Procedure for data Collection

The data was collected from radiation oncology, and the surgical outpatients units, simultaneously. Thus, two research assistants were recruited (one for each unit). Both research assistants were trained to be familiar with the information in the questionnaire and mode of administration. Data were collected from the purposively-selected participants with the aid of questionnaire. The research assistants helped with the administration and retrieval of the questionnaire. They were to check for proper completeness of the retrieved questionnaires on the spot. Data collection took a period of six (6) weeks to ensure representativeness of the of the sample size.

Method of Data Analysis

The data were analysed descriptively using frequencies/percentages, and inferentially by establishing the difference in the QoL of WLWBGCs based on the adequacy of spousal support available to them using chi-square. The hypothesis was tested at $p < 0.05$ significant level.

RESULTS

Research Question 1: What is the demographic characteristic of the participants?

Table 1: Socio-demographic characteristics (N = 160)

Socio-demographic information	Frequency	Percent
Age		
<20years (Teenagers)	3	1.9
21 - 40 years	149	93.1
41 - 65 years	8	5.0
Level of Education		
Primary	40	25.0
Secondary	68	42.5
Tertiary	36	22.5
No formal education	16	10.0
Occupation		
Employed	53	33.1
Self-employed	48	30.0
Unemployed	22	13.8
Trading	37	23.1
Marital status		
Married	122	76.3
Separated	29	18.1
Singles	9	5.6
Family type		
Monogamy	93	58.1
Polygamy	31	19.4
Did not specify family type	36	22.5
Religion		
Christianity	89	55.6
Islam	60	37.5
Did not specify	11	6.9
Husband's level of education		
No formal education	34	21.3
Primary	36	22.5
Secondary	28	17.5
Tertiary	62	38.8
Husband's occupation		
Employed	95	59.4
Self-employed	20	12.5
Unemployed	29	18.1
Trading	16	10.0

The result of the study showed that the total of one hundred and sixty (160) women participated. The ages of the women ranged from 16 - 65 years. The mean age of the women being 42 years $\pm$ 11.2 (standard deviation). In addition, 120 (76.3%) of the patients were married; 93 (58.1%) of the patients were in monogamous family, but 36 (22.5%) did not disclose the type of family they belonged to. 40 (25.0%) and 16 (10.0%) of them had primary and informal education, respectively. Table 1, also showed that 22 (13.8%) were unemployed, while the remaining ones were either employed or self-employed. Furthermore, 89 (55.6%) and 60 (37.5%) of the patients were Christians and Muslims, respectively, while the remaining did not disclose their religious affiliations. In addition, 160 of the participants' spouses, 62 (38.8%) have tertiary education, 95 (59.4%) of the spouses are employed.

Objective 2: To assess the Quality of Life of patients living with Breast and Gynaecological Cancers

Table 3: The quality of life of the Women Living with Breast and Gynaecological Cancers

Nature of QoL	Poor	Good	Statistics			Poor	Good	Std. D
	N (%)	N (%)	Mean	Min.	Max.			
Physical QoL	47(29.4)	113(70.6)	4.29	0	12	0-4	>4	2.60
Emotional QoL	70 (43.8)	90(56.2)	7.96	0	15	0-8	>8	3.26
Social QoL	54 (33.8)	106(66.2)	10.23	2	15	2-10	>10	4.11
Sexual QoL	47 (29.4)	113(70.6)	7.22	0	15	0-7	>7	3.84
Spiritual QoL	40 (25.0)	120(75.0)	9.83	0	12	0-10	>10	3.76

Min. = Minimum

Max. = Maximum

Out of the 160 patients studied, 70 (43.8%) had poor emotional quality of life (QoL), while 47 (29.4%) had poor physical and sexual QoL. Besides, 54 (33.8%) poor social QoL, while 47 (29.4%), and 40 (25.0%) were experiencing sexual QoL, and spiritual QoL, respectively.

Research Question 3: What level of spousal supports was available to the WLWBGCs?

Table 4: Spousal Support to Patients Living with Gynaecological Cancers

Spousal Support			Statistics					
	Adequate	Inadequate	Mean	Min.	Max.	Poor	Good	Std.D
Emotional Spousal support	118 (73.8%)	42 (26.2%)	18.24	0	24	0–18	>18	8.52
Informational Spousal support	118 (73.8%)	42 (26.2%)	11.28	0	15	0–11	>11	5.39
Instrumental Spousal Support	114 (71.2%)	46 (28.8%)	15.68	0	21	0–17	>17	7.44

Min. = Minimum

Max. = Maximum

Table 4 summarizes the varying aspects of spousal support to patients living with cancers. Out of the 160 women studied, 42 (26.2%) received inadequate emotional spousal support, and inadequate informational spousal support, while 'Instrumental Spousal Support' was inadequate for 46 (28.8%) women as well.

Research Question 4: What influence did the spousal supports have on the physical, emotional, social, sexual and spiritual life of the WLWBGCs?

Hypothesis: WLWBGCs who received adequate spousal support have significant better QoL than WLWBGCs who received inadequate spousal support.

Spousal Support	QoL		X ²	df	p-value	Remark
	Poor	Good				
Inadequate Spousal Support	29 (33.7%)	16 (21.6%)	2.88	1	0.113	Not Significant
Adequate Spousal Support	57 (66.3%)	58 (78.4%)				

Table 5 summarizes the variance QoL between the two categories of WLWBGCs (i.e. those who received adequate spousal support and the other who received inadequate spousal support. Women who received adequate spousal support contributed more to the proportion of those who experienced 'Good QoL' than women who received inadequate spousal support. However, the difference in the QoL experienced by the two categories of women was not significant, statistically (p-value > 0.05).

Discussion

The mean age of the women was 42 years 11.2 (standard deviation). This mean age happens to fall within the reproductive age and it contributes largely to the work force. The World

Health Organization takes the reproductive age of women to be 15 – 49 years. However, a previous study had shown that the mean age of women suffering from breast or gynaecological cancers was 54 years (Evse et al, 2014). The current study is similar to a study that reported women age to be 40 years having breast cancer (Lawrence, Perez, Hernández, Miller, Haas, Irie, & Villén, 2015). This is an indication for effective and timely cancer screening programmes for all women.

In this study, over one-quarter (29.4%) of the women experienced poor sexual QoL due to the fact that the women feel less of a woman (less feminine) and not satisfied with their present sexual life. It has been reported earlier that

female sexuality is usually affected more negatively and such sexual problems continue for a longer time in breast and gynaecological cancers than in other cancer types and chronic diseases (Errihani et al, 2010). Also, similar to the study is a report that female cancer patients engage in fewer sexual behaviours and experience lower levels of sexual arousal than healthy women (Emilee, Ussher, &Perz, 2010). This is indicating that more than a quarter of the women treated with breast or gynaecological cancers have depreciated quality of reproductive life which may affect home and increase rate of divorce in the society. Nevertheless, the spiritual life, which searches and sustains meaning for living of the women is equally poor due to the fact that one quarter of the women's population (25%)'s quality of spiritual life is low. This denotes that the women may be hopeless of their condition, may not find meaning in living and loss faith in God despite the fact that the study revealed that majority of the women are religious. This was in contrast with a study on the quality of spiritual life of women living with gynaecological cancers, that was reported that the spiritual was found to be the highest mean which was due to the fact that the women were praying, visiting mosques, attending religious meetings/institutions, and having positive thoughts which was quite effective in increasing the patients' spiritual wellbeing (Akyuz et al, 2015).

Furthermore, it was discovered in the study that spousal support has negative effect on the QoL of the WLWBGCs. This was contrary to Lepore & Revenson, (2014) who said that spouses are the main source of support for the majority of chronically-ill patients. Surprisingly, it was found in the study that those women who received adequate spousal support experience poor quality of life. This could have been that the women were over-pampered, too dependent and could not get out of their weakness or hysteria. From this, it was suggested that we use *expo facto* as our design and come up with the role played by spousal support in QoL of women living with cancers.

Summary

Limitation of the study

The study can be generalized to all the WLWBGCs in UCH but replication of the study

in other settings may be required.

Conclusion

The research study was on the influence of spousal support on the quality of life of WLWBGCs in the University College Hospital (U.C.H), Ibadan, Nigeria. The findings from the study revealed that the QoL of the WLWBGCs in UCH is poor as evident by the reported poor physical, emotional, social, sexual and spiritual life. The spouses of these women provided emotional, informational and instrumental support to these women, although it was inadequate. However, these supports did not in any way improve their QoL significantly. Meanwhile, those who did not receive spousal support but experienced good QoL could have been that they were able to adapt as a result of other factors. This could be an indication for further studies.

Recommendations

In this study, spousal support for the WLWBGCs did not significantly improve their QoL. Probably, the women may benefit from other forms of social or economic supports. This calls for further studies. Meanwhile, the stakeholders should find a way of improving the QoL of the WLWBGCs through varying intervention programmes as deemed appropriate, particularly, now that this study has reported insufficiency of spousal support in the improvement of QoL of this category of women.

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Enhancing Retention and Performance in Numeracy Concepts through Meta-cognitive Training in Computer-mediated Classrooms

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Abstract:

This study determined the effects of meta-cognitive training on pupils' retention of learned numeracy concepts in computer-mediated classrooms. Pretest-posttest control group experimental design was adopted. The population comprised primary school pupils in Osun State while the sample comprised 39 primary three pupils from two schools in two educational zones of the State. Purposive sampling method was used based on availability of computer facilities in the selected schools. This research made use of three instruments which are: Pupils' Achievement Test on Numeracy (PATON,) Computer Numeracy Instructional Package for Primary School Children (CNIP²SC) and One treatment instrument which is Meta-cognitive Training Manual (MCTM). Data obtained were analyzed using Analysis of Covariance (ANCOVA). Results indicated that meta-cognitive training enhances pupils' performance in numeracy in a computer-mediated classroom ($F = 1.20$; $p < 0.05$). Furthermore, meta-cognitive training also enhances retention of learned numeracy concepts of the learners ($F = 6.64$; $p < 0.05$). In addition, sex, which was used as a moderating variable, did not have a significant effect on the performance of pupils. ($F = 2.16$; $p > 0.05$). The study concluded that meta-cognitive training did enhance performance and retention of the pupils in computer-mediated classroom. It, therefore, recommended that teachers should be encouraged to use meta-cognitive training as a strategy in teaching numeracy.

Keywords: Meta-cognitive training, numeracy concepts, retention, computer-mediated classroom

Introduction

Nigeria National Policy of Education (NPE 2004) defines primary education as the education that is given to children from ages six to twelve years, because secondary and higher school levels are built upon primary level education which is the key to education (Federal Republic of Nigeria. (FRN, 2004). Mathematics and computing are part of the core subjects in the Nigerian educational system in which numeracy is integrated.

The National Numeracy Benchmarks Taskforce (1997) defines numeracy as the way by which mathematics is being used to meet various needs in all ramifications. State and Territory curriculum documents also support this definition and expanded it to further mean the ability to think very well and communicate. (Queensland Department of Education, 1994, cited in AAMT/DEETYA, 1997).

The world is going digital by the day and numeracy skill is needed in dealing with daily activities. Even when the computer is used to

perform some functions like calculating, the knowledge of numeracy skill is still needed in operating the system. Moreover, part of the components of Mathematics is being detailed in providing an answer to a problem. The answers are normally the same but the step by step by which the answer is arrived at might not be the same. Thus, arriving at the correct answer is the foundation which holds numeracy. Kravitz (2013) stated that Mathematics is a skill that is required of everyone in dealing with daily activities and prevents one from being cheated.

According to Onah, (2003), however, achievement in Mathematics when compared with other science and technological subjects has been a source of concern to some researchers. Meanwhile, in recent times, students' mathematics achievement at all levels in Nigeria has not been encouraging (Onyekuru, 2015). To arrest this situation, the use of computer has been introduced into the classrooms Fengfeng (2008) believes that the use of computers may have positive effect on the

achievement in Mathematic at 4th and 5th grades in the primary schools. (Gbenga-Akanmu & Jegede, 2015) postulated in their study that the introduction of computer in teaching is expected to benefit all groups of learners.

Meanwhile, studies have associated poor performance of pupils to bad foundation and not using the appropriate strategy in teaching certain subjects, particularly Mathematics. Studies have shown that meta-cognitive training had come to the rescue in other subjects. Today's classrooms are becoming computer-driven which makes it therefore necessary to determine whether meta-cognitive training as an intervention will impact better students' numeracy performance and retention of learned numeracy concepts. Ojimba, (2012) opined that the use of appropriate strategy of constructivism should be imbibed in teaching mathematics, which gives room for students to learn and sustain their learning. In addition, the use of computer-aided instruction is a strategy that can be used to improve performance of students in mathematics.

This study is hinged on Flavell's Metacognition Theory (1971). He was encouraged by the work of Jean Piaget. The theory had found its way into the conventional wisdom of metacognition of intentionality. This has to do with thinking that is intentional with a set goal and involves performing an action in step wise manner. The Flavell's meta-cognitive theory is relevant and applicable to this study within the context of meta-cognitive training that was given to the participants in the experimental group because it involves thinking that is intentionally carried out without unhurried activities by the pupils. The pupils were taught how to think properly before solving numeracy questions, plan their work, and look for different strategies for solving numeracy problems. In addition, they were able to monitor and take charge of their learning themselves as stressed in Flavell's theory. The participants were given some practical tasks to carry out which made them to think, identify situations in which intentional and certain information that was needful for solving the problem was being applied, as stressed by Flavell. The participants were able to

retrieve information on a particular method that was being used to carry out the tasks that was being given to them, which is also part of what Flavell meta-cognitive theory talks about. Recalling is very important in numeracy and the participants were able to exhibit this very well during the study.

According to De Corte, Verschaffel & Op'tEynde (2000), self-regulation constitutes a feature of effective learning and problem-solving. This skill is aimed at using meta-cognitive knowledge strategically to achieve cognitive goals. The ability to be in charge of one's learning plays a main role in the learning process. Self-regulatory behaviors in Mathematics include identifying how to solve a particular problem with a good knowledge of the particular step to use and apply where necessary to achieve a desired goal. In the past years, this skill has been noticed to be one of the most pertinent predictors of fulfilling difficult learning tasks (Van der Stel & Veenman, 2010).

The following objectives guided this study to:

- a. Determine the effects of meta-cognitive training on pupils' performance in numeracy in a computer-mediated classroom;
- b. Examine the effects of meta-cognitive training on retention of learned numeracy concepts in a computer-mediated classroom;
- c. Investigate the moderating effects of sex on the outcome of meta-cognitive training of the learners.

Research Hypotheses:

- H0₁ There is no significant effect of meta-cognitive training on pupils' performance in numeracy in a computer-mediated classroom;
- H0₂ There is no significant effect of meta-cognitive training on retention of learned numeracy concepts in a computer-mediated classroom;
- H0₃ There is no significant effect of sex on the outcome of meta-cognitive training in the performance of the learners in numeracy.

Method

The pretest-posttest control group experimental design was adopted. The population of this study comprised primary school pupils in Osun State while the sample comprised 39 primary three pupils from two schools in two educational zones of a State from six educational zones by using multistage sampling techniques. Purposive sampling method was used based on availability of computer facilities in the selected schools. An intact class of primary three was used for this study which was randomly selected from the arms of primary three in the schools. One of the schools was assigned to experimental group while the second school serves as the control group. This research made use of three instruments which are: Pupils' Achievement Test on Numeracy (PATON,) Computer Numeracy Instructional Package for Primary School Children (CNIP²SC) and one treatment instrument which is Meta-cognitive Training Manual (MCTM), Pupils' Achievement Test on Numeracy (PATON).

The research design is represented schematically as follows:

Y_1	X_1	Y_2	Y_3	Experimental Group
Y_4	-	Y_5	Y_6	Control Group

Y_1 = pretest administered to experimental group;
 X_1 = meta-cognitive training given to experimental group;
 Y_2 = post-test administered to experimental group;
 Y_3 = retention-test administered to experimental group;
 Y_4 = pre-test administered to control group;
 Y_5 = post-test administered to control group;
 Y_6 = retention-test administered to control group.

The research instruments used for this study were validated by experts in Early Childhood and Educational Technology. Some necessary corrections and adjustments were made to the instruments to establish the content validity which was pilot tested (Rossiter, 2011). To ascertain the reliability of the instruments, a pilot study was carried out on pupils outside the study area for the appropriateness of all the instruments. The study adopted the test-retest method. This method had been used for calculating the reliability of instruments by earlier researchers among which was Bolarinwa (2015). The results correlation ratio using Pearson's Correlation formula was 0.82 for PATON which justifies the positive reliability of

the instrument.

The CNIP²SC was given to expert in Educational Technology who checked the package and made some minor corrections before the use of the package. Such as the inclusion drills and practice, then the package to respond in low voice "WRONG" if a wrong answer is given and gives another opportunity to repeat the same question. In addition, the package was field-tested on a group of primary III outside the study area. Some questions had wrong answers and this was corrected before using it on the real group for the experiment.

The Meta-cognitive Training Manual was also subjected to face and contents validity by experts in the field of Early Childhood. Also, addition, the MCTM was field tested on a group of primary III outside the study area by the researcher and the research assistant in attendance. Some necessary corrections which include reducing the specific objectives and giving an explicit explanation on how to achieve the stated objectives were made before using it on the real group for the experiment

PATON was used by the researcher for the pre-test with all the participating pupils (control and experimental). The researcher conducted the meta-cognitive training with the experimental group for a period of 3 weeks by using the (MCTM). The training was based on how the participants could follow a step by step wise method in solving numeracy problems.

The researcher taught numeracy concepts with all the participants both at the experimental and the control group using (CNIP²SC) for six weeks in a computer environment after which the researcher conducted a post-test on all the participants at the end of the sixth week using the PATON.

At exactly two weeks, the researcher conducted a retention test on the two groups. The data obtained were analyzed using descriptive and inferential statistics of Analysis of Covariance (ANCOVA) statistical technique.

Results

1. There is no significant effect of meta-cognitive training on pupils' performance in numeracy in a computer-mediated classroom.

Table 1a: Estimated adjusted means

Group	Mean	Std. Error	Confidence Interval
Control	7.61	2.39	6.37 10.87
Experimental	11.98	2.01	9.13 14.03

Table 1a shows the means of the two groups with the experimental group having higher mean

value. Furthermore, analysis is carried out to determine whether the difference in means is significant or not and the result is presented in Table 1b.

Table 1b: Effect of meta-cognitive training on pupils' performance in numeracy in a computer-mediated classroom

Source	Partial SS	Df	MS	F	p-value	Partial eta2
Model	631.0423	15	62.0695	2.82	0.0124*	
Group	212.9333	1	21.9333	1.20	0.0166*	0.18
Residual	343.3167	23	14.9268			
Total	974.3590	38	25.6410			

Field survey, 2017

Table 1b shows that the difference between the mean scores of the groups' performance is significant with $F = 1.20$; $p < 0.05$. Hence, there exist a significant difference between the performance of the control group and the experimental group.

1. There is no significant difference of meta-cognitive training on retention of learned numeracy concepts in a computer-mediated classroom.

Table 2a: Estimated adjusted means

Group	Mean	Std. Error	Confidence Interval
Control	7.73	2.37	6.31 10.78
Experimental	12.61	2.23	9.17 14.31

Table 2a showed the means of the two groups with the experimental group having higher mean value. Further analysis was carried out to determine whether the difference in means is significant or not and the result is presented in Table 2b.

Table 2b: Effect of intervention (meta-cognitive training) on pupils' retention

Source	Partial SS	Df	MS	F	p-value	Partial eta2
Model	595.3136	29	20.5281	8.98	0.0008*	
Group	15.1885	1	15.1885	6.64	0.0298*	0.24
Residual	20.5839	9	2.2871			
Total	615.8974	38	16.2078			

Table 2b indicates that there is a significant difference in the retention scores of the two groups with $F = 6.64$; $p < 0.05$. By implication, there exists a significant difference between the retention of the learned concepts of control and experimental groups.

3. There is no significant effect of sex on the outcome of meta-cognitive training in the performance of the learners in numeracy.

Table 3: Moderating effect of sex on the outcome of meta-cognitive training of learners

Source	Partial SS	Df	MS	F	p-value	Partial eta2
Model	582.6707	30	19.4224	4.68	0.0141*	
Group	12.6838	1	12.6838	2.16	0.0269*	0.15
Sex	0.9320	1	0.9320	0.22	0.6484	
Pre-test score	158.7750	14	11.3411	2.73	0.0783	
Post-test score	211.3063	14	15.0933	3.63	0.0362*	
Residual	33.2267	8	4.1533			
Total	615.8974	38	16.2078			

Field survey, 2017

intervention.

Table 3 shows that sex did not significantly ($F = 2.16$; $p > 0.05$) affect how the meta-cognitive training predicted pupils' performance.

Discussion

For hypothesis one, the finding of this study from Table 1 revealed that there was a significant effect of meta-cognitive training on the pupils' performance. This finding goes along with the findings of Dignath and Buttner (2008). The training emphasized meta-cognitive strategies which had a positive outcome on the pupils' performance. Yunusa (2010) who investigated the outcome of this same strategy on instruction on mathematics achievement in low-achieving students found that it enhanced performance in mathematics. The result further showed that it was the group that had the meta-cognitive training that performed better than the control group. Even though Yunusa's study was done in Nigeria, the participants were secondary school students while the current study used primary school pupils. It shows that the intervention works for both secondary and primary school pupils when been exposed to meta-cognitive training. In addition, the result of this study lend support to Krasmarski & Mevarech (2003) study who reported a positive effects of this same strategy on students' mathematical reasoning and in different computerized environments and that meta-cognitive is teachable. This study suggests that meta-cognitive training can counter the negative or stressful perceptions in mathematical performance and that pupils with numeracy problems can benefit from meta-cognitive

However, the findings of Legg, Angela and Marie, (2009) negated the result of the current study that meta-cognitive necessarily will affect performance in numeracy. This is likely to be because *Legg et. al.* (2009) work with college students and their research was on Math Anxiety which was effective.

Furthermore, the result for hypothesis two revealed that the intervention had a significant effect on retention of the pupils on learned numeracy concepts. This finding lends supports to Bonnie (2013), Metacognition and its Effect on Learning High School Calculus that showed that training of meta-cognitive enhances learning and retention of learners. It is also in agreement with the study of Spellman, Mulder, & Carsten-Conner (2016) who worked on this intervention in the ecology classroom: In addition to this, Zare & Mohammadi, (2011) research on dealing with mathematical problems in students observed that this processing can positively help with dealing with problem and transfer of learning which help in increasing the level of retention of the students. This finding is in contrast to the finding of Donna (2006) who found out that the strategy did not improve the retention of students.

The result for hypothesis three showed that sex did not significantly affect how meta-cognitive training predicted pupils' performance. This result concurs with the findings of Spencer (2004), *Gbenga-Akanmu & Jegede* (2015), *Siti & Corebima* (2014) whose studies revealed that sex does not have any effect on the retention of

learners.

Based on the findings of this research work, it was concluded that meta-cognitive training as an intervention among primary school pupils in a computer-mediated classroom enhanced their performance and retention in numeracy and that there was no moderating effect of sex on how meta-cognitive training predicted pupils' performance.

The study therefore recommend that teachers should be encouraged to use meta-cognitive training as a strategy in teaching numeracy.

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Effect of Declarative Knowledge Approach on Students' Performance in Quantitative Economics

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Abstract

This study examined the effect of declarative knowledge approach (DKA) on students' performance in quantitative Economics. A sample of 156 SS II students randomly selected from six secondary schools in Oyo East, Atiba and Oyo West LGAs of Oyo State participated in the study. A quasi-experimental study, with 2 X 3 factorial designs was adopted. Participants were assigned randomly to treatment groups: Declarative Knowledge Approach (DKA) and Conventional Knowledge Approach (CKA). The instrument used to collect data were Economics Achievement Test ($r = 0.94$) and Numerical Ability Test (NAT) ($r = 0.84$). Three null hypotheses were tested at 0.05 significance level. ANCOVA was used in analysing collected data. Treatment significantly affected students' performance ($F_{(1,149)} = 1095.275, p < 0.05$). Partial Eta Square (η^2) of 0.880 indicated that 88% variance observed in Economics students' achievement was due to treatment's (DKA) effect. The main effect of numerical ability was not statistically significant ($F_{(2,149)} = 0.469, p > 0.05$). The interaction effect of treatment and numerical ability ($F_{(2,149)} = 1.557, p > 0.05$) was not statistically significant. It was thereafter suggested that teachers must permit students to supply relevant examples in the course of teaching; teachers should also employ appropriate approach such as declarative knowledge approach in the teaching of Quantitative Economics.

Key words: Declarative Knowledge Approach, Numerical Ability, Performance

Introduction

Economics is of high importance to the stability and economic growth of any nation. It serves as a catalyst for understanding the complexities of modern economic trends globally. Available literature reveals that some variables have been identified to be responsible for the students' irregular achievement in Senior Secondary School Economics. Among these are perceived difficult nature of Economics (Ogunkola & Samuel 2011); gender perception, students' poor attitude (Ogundipe, 2004), poor numerical approach, poor teaching methods, and teacher attitude to teaching (Oyediji, 2014).

WAEC's Chief Examiners' reports in the last ten years (2006-2015) have shown that Economics students failed to attain high academic excellence particularly in the area of quantitative Economics. Economics is a quantitative subject because it utilizes a step-by-step mathematical approach. For teaching approach to enhance the learning of Economics, it should embrace concepts and problem-solving methods.

Economics, if properly taught, will produce an efficient and productive person who will be able to compete perfectly and proffer solutions to the modern economic problems, and this will necessitate the use of appropriate teaching strategy. Instead of teaching the subject as a knowledge and skill-based discipline, some teachers still follow conventional approach.

Economics, by its nature, can be very useful in promoting critical and procedural thinking. Since the aim of teaching and learning of Economics is not for head-knowledge, the teaching approach used by the teacher should go beyond the mere passing of examination to systemic procedural knowledge. Availing students with knowledge and skill-based approach will go a long way in expanding intellectual skills and their ability to engage in analytical thinking.

As part of the solution to the problem of recurrent low performance, efforts have been made to imbibe innovative ways of teaching Economics in schools. In an attempt to raise level of performance in Economics, this study

therefore sought to investigate the effect of declarative knowledge approach and numerical ability on students' performance in Economics.

According to Rittle-Johnson & Koedinger (2009), declarative knowledge can be viewed as the knowledge of relevant principles and concepts of certain subjects that can be applied to new tasks. It is the knowledge which can be gained by the study of literature and media communications (Lanzer & Taatgen, 2013). Rittle-Johnson & Alibali (1999) further described it as an unambiguous kind of ideology that guides a sphere and of the connections between small portions of knowledge in an area. Declarative knowledge is hence put to use when students must comprehend how principles are put to use in solving problems, and the function of time in solving questions, and how principles are connected with the attributes of the classified problem (Turns & Meter, 2011). That is why Haapasalo & Kadijevich (2000) in Lauritzen (2012) refer to this pedagogical approach as '*educational approach*'. Hence, declarative knowledge is an approach that could enhance the learning and assessment outcomes of learners in quantitative Economics if it is properly employed.

Considering the relevance of quantitative Economics in the modern world, it is evident that failure to have numerical control is equivalent to low and poor performance in problem-solving skills. Without mathematical ability, students of Economics will find it difficult to excel in this world of numbers. Akinsola & Odeyemi (2014) then viewed numerical ability as the capability of students to perform some arithmetical or mathematical calculations off-hand or without the use of any mechanical device, an ability that could be high, medium or low. Therefore, students must have minimum numerical ability skills necessary for passing Economics. That is why Fatoke, Ogunlade, & Ibidiran (2013), asserted that problem-solving methods are more effective and reliable methods of promoting numerical skills in students and that the students of high numerical aptitude will perform better than their counterpart with low numerical ability. Akinsola & Odeyemi (2014) affirm further that students'

numerical ability could influence learning and retention and academic attainment, and also determine the imagination, language, perception, concepts formation and problem-solving ability of learners.

Concerning the stated problems, the study tested three null hypotheses at 0.05 significance level and they are as follows:

- Ho1:** The main effect of treatment has no significance on students' performance in quantitative Economics.
- Ho2:** The main effect of numerical ability has no significance on students' performance in quantitative Economics.
- Ho3:** The interaction effect of treatment and numerical ability has no significance on students' performance in quantitative Economics.

Methodology

A 2 X 3 factorial, quasi-experimental design was used to establish the effect of independent variable and also provided an avenue to look into the weight of independent and moderating variable (numerical ability) on the dependent variable. The focused population for the study was the SS2 students offering Economics in public secondary schools in Oyo East, Atiba, and Oyo West LGAs of Oyo State. Two public secondary schools were randomly picked from each local government. Six schools were used while a total number of 156 students partook in the study. Two (2) instruments were used for the study. These included: Quantitative Economics Achievement Test (QEAT) and Numerical Ability Test (NAT).

Quantitative Economics Achievement Test (QEAT) questions were adopted from the West African Examination Council (WAEC) past questions series from 1988 to 2015 for both pre and post-test covering quantitative content of concept of cost and revenue, and taxation. 30 objectives questions were used on the participants of this study and each item consists of four options A-D. The reliability of the test was determined with K-R 20 and the value was 0.94.

Numerical Ability Test (NAT) was a 9-item test adopted for use from the Newcastle University Numerical Reasoning Tests. The test was used to determine the ability of learners to reason with numbers or acquire mathematical ability, and to classify the participants of this study into three numerical ability levels (High, Medium and Low) using percentiles: Low = 0-33%; Medium = 34% - 66% and High 67% - 100%. The test was validated, and the reliability coefficient was 0.84 with Kuder-Richardson (KR-20).

Procedure for the Treatment Group (Declarative Knowledge Approach Group (DKAG))

This group was taught with the prepared teaching module and was characterised by the following:

1. Concept-based teaching approach. Learning was acquired through the knowledge of concepts.
2. Expository approach group, where factual and specific information, characteristics, terminologies, properties, phenomena, concepts, principles, and techniques were used in teaching the content.
3. Learners provided relevant examples in line with the teaching, and the teacher buttressed on the provided examples.

Mode of teaching in DKA

1. In this group, after the introduction of the content to be taught, the objectives of the lesson were made known to students;
2. Teachers initiated the teaching by explaining the fundamental component of the concept;
3. At least two students gave practical examples using the explained concept;
4. After that, the teacher of this group defined the concept in line with examples supplied by the student;
5. Objective questions were administered on students as class practice.

Data Collection

A week before treatment's application, the researcher administered Numerical Ability Test (NAT) and Quantitative Economics Achievement Test (QEAT) on participants. Responses on both instruments were immediately collected since the post-test data also depended on the same instruments. The researcher was not part of the teaching, but monitored the treatment's execution. The treatment was carried out for six weeks, thereafter QEAT was re-applied on participant as post-test.

Results

Table 1: Summary of Analysis of Covariance (ANCOVA) of Students' Performance in Economics by Treatment and Numerical Ability

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9448.966a	6	1574.828	250.535	0.000	0.910
Intercept	1616.044	1	1616.044	257.092	0.000	0.633
Pre-Achievement	35.181	1	35.181	5.597	0.019	0.036
Treatments	6884.739	1	6884.739	1095.275	0.000	0.880
Numerical	5.901	2	2.951	0.469	0.626	0.006
Treatments * Numerical	19.572	2	9.786	1.557	0.214	0.020
Error	936.592	149	6.286			
Total	32491	156				
Corrected Total	10385.56	155				

a R Squared = 0.910 (Adjusted R Squared = .906)

F (2,149) = 1.557 p < 0.05

Hypothesis 1: The main effect of treatment has no significance on students' performance in quantitative Economics.

Table 1 shows the summary of Analysis of Covariance (ANCOVA) of students' post-test achievement scores in Economics by treatment and numerical ability. The result revealed that the effect of treatments on Economics students' achievement was statistically significant (F

$_{(1,149)} = 1095.275$, $p < 0.05$); therefore, there was rejection of null hypothesis. Table 1 further showed that the Partial Eta Square (η^2) of 0.88 indicated that 88% variance observed in Economics students' achievement was due to treatment's effect. Sidak Post-hoc analysis was carried out to decide which group differs significantly among the two treatment groups, and this can be found in Table 2.

Treatments	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Declarative group	21.173a	0.364	20.454	21.892
Control group	5.418a	0.299	4.827	6.008

Pre-Achievement score = 8.4872.

Table 3: Estimated Marginal Means for Post -Achievement Score of Treatment

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
Declarative group	Control group	15.755*	0.476	0.000	14.814	16.696
Control group	Declarative group	-15.755*	0.476	0.000	-16.696	-14.814

Based on estimated marginal means

* The mean difference is significant at the .05 level.

b Adjustment for multiple comparisons: Sidak.

From Table 2, participants in Declarative group had higher adjusted mean score of ($X = 21.173$) than those in control group ($X = 5.418$). Table 3 confirms that the distinction between treatment and control groups was statistically significant.

Hypothesis 2: The main effect of numerical ability has no significance on students' performance in quantitative Economics.

The outcome in table 1 revealed that the effect of

numerical ability on students' performance in quantitative Economics was not statistically significant ($F_{(2,149)} = 0.469$, $p > 0.05$); therefore the null hypothesis was sustained. Table 1 further showed that the Partial Eta Square (η^2) of 0.006 (0.6%) accounted for variance observed in Economics students' achievement. Adjusted Estimated Mean was done to conclude which ability level differs significantly among the three in Table 4.

Table 4: Estimated Marginal Means for Post-Achievement Score of Numerical Ability

Numerical Level	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low Ability	13.567a	0.275	13.023	14.111
Moderate Ability	13.231a	0.423	12.396	14.066
High Ability	13.088a	0.484	12.132	14.044

Pre-Achievement score = 8.4872.

Table 4 reveals that the highest adjusted mean score (13.567) could be traced to the low ability participants, followed by moderate ability (13.231), while the lowest adjusted mean score (13.088) was found among the high ability participants.

Hypothesis 3: The interaction effect of treatment and numerical ability has no significance on students' performance in quantitative Economics.

The findings in table 1 revealed that the

interaction effect of treatment and numerical ability on students' performance in quantitative Economics was not statistically significant ($F_{(2,149)} = 1.557$, $p > 0.05$); therefore the null hypothesis was upheld. Partial Eta Square (η^2) of 0.020 in Table 1 indicated that both the treatment and numerical ability could only account for 2.0% variance observed in Economics students' achievement. Adjusted Estimated Mean in table 5 was explored to resolve which variables differ significantly between the two treatment groups and the ability levels.

Table 5: Estimated Marginal Means for Post-Achievement Score of Treatment and Numerical Ability

Groups	Numerical Level	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Declarative group	Low Ability	21.539a	0.404	20.741	22.337
	Moderate Ability	21.625a	0.726	20.191	23.059
	High Ability	20.354a	0.697	18.976	21.732
Control group	Low Ability	5.595a	0.374	4.856	6.333
	Moderate Ability	4.836a	0.44	3.967	5.706
	High Ability	5.822a	0.678	4.482	7.163

Pre-Achievement score = 8.4872.

The highest adjusted mean score in Table 5 was traced to students of Declarative group of low, moderate and high ability levels (21.539, 21.625 & 20.354 respectively) while control group had the lowest adjusted mean score of low, moderate and high ability levels (5.595, 4.836 & 5.822 respectively).

Discussion

The result showed that the main effect of treatment on students' performance in quantitative Economics was significant. The finding was in agreement with Rittle-Johnson and Alibali's (1999) report that found that conceptual knowledge significantly influenced Mathematics students' performance. In this study, participants that were exposed to declarative knowledge approach were far better than those in the control group. Thus, it could be explained that declarative knowledge approach proved more facilitative as far as achievement in quantitative Economics is concerned.

This study is in conformity with Brian's (2016) view that the numerical score alone is not enough to predict students' ability in Mathematics which also calls for a high level of abstract reasoning. This implies that students' performance in quantitative Economics is not a function of their numerical abilities. The result further reveals that higher adjusted mean score wrong with students of low ability, and this is closely followed by moderate ability students, while high ability students had the lowest adjusted mean score. The numerical ability of most students in this study was low. However, this study contravenes the finding of Fatoke, Ogunlade and Ibidiran (2013) and Akinsola and Odeyemi (2014), which states that the higher the numerical ability, the higher the students' performance.

The result of this study showed further that the interaction effect of treatment and numerical ability on students' performance in Economics

was not significant. This finding is in line with Bull (2009) which indicated negative correlation between students' math anxiety levels and their math (numerical) test scores. This is in agreement with Falaye (2006) which attested to non-significant effect of treatment and numerical ability on students' self-perception. This finding reveals that the interplay of treatment and numerical ability cannot justify high performance in quantitative content of Economics. This finding is contrary to Emeke and Adegoke (2001) that concluded that numerical ability has the power to impact on students' performance.

Conclusion

It can be deduced that the treatment (Declarative knowledge Approach) has significant influence on students' performance in quantitative Economics. This finding shows that when appropriate approach is employed in the teaching and learning of Economics, students' performance will be highly influenced positively. It was also discovered that students' participation in supplying practical examples during the teaching facilitated their performances. There was also a clear indication that numerical ability does not determine high performance provided an appropriate instructional approach is engaged.

Recommendations

In line with the findings of this study, it is suggested that learners should take part in the teaching and learning processes of quantitative Economics. Teachers must allow students to supply relevant examples to the teaching of Economics. They should also employ appropriate approach such as declarative knowledge approach in the teaching of Economics. Writers and authors should explore the fitness of Declarative Knowledge Approach while writing Economics texts. Nigerian Educational Research and Development Council (NERDC) should experiment the applicability of DKA to Economics and other quantitative-based subjects. Finally, researchers can delve into the usefulness of this knowledge approach to other subjects.

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Nurses' perception on factors responsible for workplace violence against nurses in selected hospitals in Ilorin, Kwara State

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Abstract

Violence in the workplace is a public issue globally. In the health sector, nurses have been found to be the main victim of this menace and if not controlled, it may have detrimental impact on nursing services. This study investigated the forms of workplace violence experienced by nurses and their perception on factors responsible for it in selected hospitals in Ilorin, Kwara State. A descriptive research design using self-administered questionnaire was employed and a purposive sample technique was used to select a simple size of 285 registered nurses for the study. Results showed that 55.8% of the nurses had been assaulted at their workplace and the commonest form was verbal assault from patients' relatives and 25.3% did nothing about the assault. The major factors responsible for workplace violence identified by nurses were alcohol abuse or substance abuse 224 (78.6%), long waiting hours 222(77.9%), highly stressed patients and relatives, 213 (74.8%), language or culture difference 204 (71.6%), inappropriate staff attitude 198 (69.5%), staffs' frustration 197 (69.2%) and negligence of duty 196 (68.8%). There was no significant difference found between perceptions of workplace violence among nurses in the selected hospitals. Therefore, policy makers should implement policies for reporting and addressing workplace violence and as well as gear up the security level of hospitals. Nurses should improve their skill in human relations and learn how to identify indicators of violence and avert potential violence.

Introduction

Workplace violence is a public phenomenon which cuts across all work settings and occupational groups in developed and developing countries. It constitutes a threat to effective and efficient service delivery in every occupational setting (Agunwa, 2018). Violence, aggression and harassment exist in virtually all workplace and this does not only affects the individual's health and morale, it has a negative effect on productivity due to reduced self-esteem and motivation (Abodunrin, Adeoye, Adeoni & Akande, 2014).

Globally, about a quarter of workplace violence occurs in the health sector (Di Martino 2003; Azodo, Ezeja, & Ehikhamenor, 2011). Numerous studies conducted across countries reported that workplace violence is a problem for health care workers in both developed and developing countries (Boafo & Hancock, 2017; Berry, 2013; Nelson, 2014). Workplace violence has been recognised internationally as a major public health and human right issue, in a Joint Programme launched by International Labour Organisation (ILO), the International Council of

Nurses (ICN), the World Health Organisation (WHO) and Public Services International (PSI) to develop sound policies and practical approaches for the prevention and elimination of violence in the health sector (WHO, 2019).

Workplace violence in the health care sector may lead to poor quality of care, increased rate of absenteeism of healthcare professionals; affect availability of health services to the general public, unhealthy work environment, improper societal behaviours, increasing health costs, and deterioration of staff health (Rayan, Qurneh, Elayyan, & Baker, 2016).

Unfortunately, there is increasing evidence of workplace violence in the health care sector and all categories of healthcare workers are at risk of violence, though at different degrees with the nurses having up to three times higher than others (Abodunrin, Adeoye, Adeoni&Akande, 2014;WHO, 2019). Abusive behaviour or workplace violence in the health sector is so toxic that nurses increasingly report that it is one reason they abandon active practice (Samir, Mohammed, Moustafa, & Abousaif, 2012). Moreover, violence against nurses is a multifaceted and tenacious occupational hazard

facing the nursing profession. This violence can take the form of intimidation, harassment, stalking, beatings, stabbings, shootings and other forms of assault. Nurses are among the most assaulted workers in the Nigerian workforce (Udogwu, 2016). Sources of violence against nurses include patients, patients' relatives, peers, supervisors, subordinates and other professional groups. The increase in violence between nurses and patients and their families in health care settings can be seen as a type of "ward rage" triggered by frustration and discontentment with the quality of care received. Such abusive behaviour contributes to the high rates of nurses' burn-out (Sisawo, Yacine, Ouedraogo & Huang 2017). Violence in the health care sector can be categorised as either 'Vertical' occurring between health care professionals and the care recipients, or 'Horizontal' occurring among health care professionals. Vertical violence may be from care recipients toward carers or from carers toward care recipients. Horizontal violence occurs among carers for example in the concept of bullying (of a junior staff by a senior) (Needham, Kingma, O'brien, McKenna, Tucker & Oud, 2010).

Nurses' role in health care services and management cannot be over-emphasised. They are the most exposed population to workplace violence in the health care industry due to their direct, frequent and lengthy contact with the patients, their relatives and also, other health professionals, they serve to connect all the arms of the health team together and their role is pivotal. Several studies have been conducted in Nigeria, on the forms and prevalence of workplace violence against health care professionals (Abodunrin et al, 2014) but not much has been done on the perception of nurses who are the top victims of workplace violence in the health care sector, in Nigeria. Anecdotal reports have been given on incidents of workplace violence against nurses in Nigeria but without real statistical evidence to prompt necessary actions from relevant quarters. Hence, violence against nurses have persisted and been on the rise. This has therefore, necessitated this study on the perception of nurses on factors responsible for workplace violence against nurses in selected government hospitals in

Ilorin, Kwara State, Nigeria.

Research questions

- What is the socio-demographic variable of the nurses in the selected hospitals?
- What are the forms of violence experienced by nurses in the selected hospitals in Ilorin, Kwara State?
- What are the perceived factors responsible for workplace violence against nurses in the selected hospitals in Ilorin, Kwara State?
- What are the perceived effects of workplace violence on nurses' job performance in the selected hospitals in Ilorin, Kwara State?

Research Hypothesis

There is no significant difference between perception of workplace violence among nurses at the two selected hospitals

Methodology

A cross-sectional descriptive survey was adopted to assess the perception of nurses on the factors responsible for workplace violence against nurses in two selected government hospitals in Ilorin, Kwara State. Out of the five government hospitals located in Ilorin, two hospitals were randomly selected using the fish bowl method. One tertiary and one secondary health institutions were selected. The target population for this study is the registered nurses licensed by the Nursing and Midwifery Council of Nigeria (NMCN) who are employed and working at the selected government hospitals. The total population of nurses in the tertiary institution was 714 and 55 nurses in the secondary institution. The sample size was determined using fisher's formula as follows; $n = \frac{z^2 pq}{d^2}$, where n = Number of sample, Z = 1.96, P = prevalence = 53.5% (Abodunrin et al, 2014), q = 1-p, d = 0.05. Purposive sampling technique was used to select a sample size of 298 respondents. The inclusion criteria consist of registered nurses working in the selected hospitals and were willing to participate in the study while registered nurses in the selected hospitals that were on leave throughout the period of data collection were excluded from the study. The instrument for data collection was

structured questionnaire developed by the researchers to suit the purpose of the study. Face and content validity of the research instrument was done by experts in the field of study, while the reliability of the instrument was tested using split half reliability test using Pearson Product Moment Correlation co-efficiency and a score of 0.77 was obtained which was considered reliable. The instrument was administered over a period of four weeks and the completed questionnaires were coded and analyzed using SPSS version 21. The results were presented using both descriptive and inferential statistics. Descriptive statistics in form of frequency and percentage tables. Inferential statistics in form of student t- test was used to test the hypotheses formulated at 0.05 (5%) level of significance.

All related ethical issues were addressed during the conduct of this study. Ethical principles of autonomy, anonymity, confidentiality, beneficence and non-maleficence were all duly considered. Ethical clearance was obtained from the Hospital's Ethical Committee before the commencement of data collection, informed consent was obtained from each participant before their participation in the study and the participation was made voluntary. The names of the respondents were not requested to ensure confidentiality. No one was deceived or coerced into participating in the study and withdrawal from the study at any stage was allowed without any form of discrimination or penalties.

Results

Table 1: Socio- Demographic Characteristics of Respondents (n=285)

Socio-demographic variables	Frequency	Percent
Age in Years		
20-30	127	44.6
31-40	98	34.4
41-50	41	14.4
51-60	19	6.6
Gender		
Male	33	11.6
Female	252	88.4
Religion		
Islam	136	47.7
Christianity	149	52.3
Marital Status		
Single	80	28.1
Married	205	71.9
Ethnicity		
Yoruba	241	84.6
Hausa	8	2.8
Igbo	14	4.9
Others	22	7.7
Type of Hospital		
Tertiary	243	85.3
Secondary	42	14.7
Years of Experience		
1 – 5 years	78	27.4
6 – 10 years	135	47.4
11 – 15 years	33	11.6

16-20	15	5.2
20 And Above	24	8.4
Professional Cadres		
Nursing Officer II	71	24.9
Nursing Officer I	63	22.1
Staff Nurse	30	10.5
Senior Nursing Officer	66	23.2
Principal Nursing Officer	16	5.6
Assistant Chief Nursing Officer	5	1.8
Chief Nursing Officer	30	10.5
Assistant Director Nursing Services	4	1.4

Table 1 shows that 127 (44.6%) of the respondents were between 20-30 years, 98 (34.4%) were between 31-40 years, 41 (14.4%) were between 41-50 years while 19 (6.6%) were between 51-60 years. Majority of the respondents 252 (88.4%) were female while 33 (11.6%) were males. 149 (52.3%) of the respondents practiced Christianity while 136 (47.7%) practiced Islam. Majority of the respondents 205 (71.9%) were married while 80 (28.1%) were single. Majority of the respondents 241 (84.6%) were Yoruba, 22 (7.7%) belonged to other ethnic groups, 14 (4.9%) were Igbo while 8 (2.8%) were Hausa. Majority of the respondents 243 (85.3%)

identified tertiary hospital as the hospital where they work while 42 (14.7%) identified secondary hospital as the hospital where they work. 135 (47.4%) of the respondents had 6-10 years of working experience, 78 (27.4%) had 1-5 years of working experience, 33 (11.6%) had 11-15 years of working experience, 24 (8.4%) had above 20 years of working experience while 15 (5.2%) had 17-20 years of working experience. 71 (24.9%) of the respondents were NO II, 66 (23.2%) were SNO, 63 (22.1%) were NO I, 30 (10.5%) were NO, 30 (10.5%) were CNO, 16 (5.6%) were PNO, 5 (1.8%) were ACNO while 4 (1.4%) were ADNS.

Table2: Forms of violence experienced by nurses (n=285)

Variables	Frequency	Percent
Have you been Assaulted in your workplace?		
YES	159	55.8
NO	126	44.2
Who Assaulted you?		
Superior colleague	44	15.4
Doctor	23	8
Pharmacist	11	3.9
Med. Lab. Scientist	5	1.8
Patient	27	9.5
Patient's relative	49	17.2
Never assaulted	126	44.2
Nature of the Assault		
Physical	16	5.6
Verbal	118	41.4
Others	25	8.8
Never assaulted	126	44.2

Respondents' Reaction to Assault

Did nothing	72	25.3
Reported to the Officer in Charge	46	16.1
Retaliated	31	10.9
Others	10	3.5
Never assaulted	126	44.2

Table 2 shows that 159 (55.8%) of the respondents stated that they had been assaulted at their workplace while 126 (44.2%) of the respondents stated that they had never been assaulted, 49 (17.2%) of the respondents stated that they had been assaulted by patient relatives, 44 (15.4%) of the respondents stated that they had been assaulted by superior colleagues, 27 (9.5%) of the respondents stated that they had been assaulted by patients, 23 (8.0%) of the respondents stated that they had been assaulted by Doctors, 11 (3.9%) of the respondents stated that they had been assaulted by Pharmacist while 5 (1.8%) of the respondents stated that

they had been assaulted by Med. Lab. Scientists. 118 (41.4%) of the respondents were verbally assaulted, 25 (8.8%) of the respondents stated that they were assaulted in other forms while 16 (5.6%) of the respondents stated that they were physically assaulted. 126 (44.2%) of the respondents were never assaulted, 72 (25.3%) of the respondents stated that there was no reaction to the assault, 46 (16.1%) of the respondents stated that they reported to the OC, 31 (10.9%) of the respondents stated that they retaliated while 10 (3.5%) of the respondents stated that they had other reactions.

Table 3: Perceived factors responsible for workplace violence (n=285)

Variable	Responses	Frequency	Percent
Irritating or inappropriate staff attitude	Strongly agree	65	22.8
	Agree	133	46.7
	Undecided	62	21.8
	Disagree	25	8.8
long waiting hours	Strongly agree	93	32.6
	Agree	129	45.3
	Undecided	44	15.4
	Disagree	19	6.7
stressed patients and relatives	Strongly agree	68	23.9
	Agree	145	50.9
	Undecided	44	15.4
	Disagree	28	9.8
Alcohol abuse or drug/substance abuse	Strongly agree	97	34
	Agree	127	44.6
	Disagree	61	21.4
	Strongly agree	59	20.7
language or culture difference	Agree	145	50.9
	Undecided	41	14.4

Access to guns and other dangerous arms	Disagree	40	14
	Strongly agree	73	25.6
	Agree	98	34.4
	Undecided	40	14
	Disagree	56	19.6
	Strongly disagree	18	6.3
staff frustration	Strongly agree	64	22.5
	Agree	133	46.7
	Undecided	38	13.3
	Disagree	42	14.7
	Strongly disagree	8	2.8
	Strongly agree	64	22.4
Role conflict between co-workers	Agree	119	41.8
	Undecided	45	15.8
	Disagree	57	20
	Strongly agree	91	31.9
	Agree	92	32.3
	Disagree	88	30.9
Bad leadership	Strongly disagree	14	4.9
	Strongly agree	69	24.2
	Agree	127	44.6
	Undecided	32	11.2
Negligence of duty	Disagree	57	20.0

Table 3 Presents perceived factors responsible for workplace violence in selected hospitals. .Alcohol abuse or drug/substance abuse 224 (78.6%), long waiting hours 222(77.9%), highly- stressed patients and relatives, 213 (74.8%), language or culture difference 204 (71.6%), inappropriate staff attitude 198

(69.5%), staffs' frustration 197 (69.2%), negligence of duty 196 (68.8%), bad leadership 183 (64.2%), role confusion between co-workers 183 (64.2%) and access to guns and other dangerous arms were the factors responsible for workplace violence

Table 4: Perceived Effects of Workplace Violence on Nurses' Job Performance (n=285)

Variable	Responses	Frequency	Percent
High rate of burnout	Strongly agree	78	27.4
	Agree	117	41.1
	Undecided	28	9.8
	Disagree	48	16.8
	Strongly disagree	14	4.9
Leaving/increased nurses' intention to leave the job resulting in understaffing	Strongly agree	80	28.1
	Agree	104	36.5
	Undecided	31	10.9
	Disagree	60	21.1
	Strongly disagree	10	3.5
post-traumatic stress disorder causing low productivity	Strongly agree	74	26
	Agree	141	49.5
	Undecided	10	3.5
	Disagree	50	17.5
	Strongly disagree	10	3.5
Negative attitude towards co-workers/other professionals	Strongly agree	84	29.5
	Agree	112	39.3
	Undecided	17	6
	Disagree	54	18.9
	Strongly disagree	18	6.3
Negative attitude and poor tolerance to clients/relatives	Strongly agree	69	24.2
	Agree	132	46.3
	Undecided	32	11.2
	Disagree	44	15.4
	Strongly disagree	8	2.8
Poor communication and discontinuity of care	Strongly agree	90	31.6
	Agree	112	39.3
	Undecided	22	7.7
	Disagree	45	15.8
	Strongly disagree	16	5.6

Table 4 shows that 117 (41.1%) of the respondents agreed that high rate of burnout is one of the effect of workplace violence on nurses' job performance, 78 (27.4%) strongly agreed, 48 (16.8%) disagreed, 28 (9.8%) were undecided while 14 (4.9%) strongly disagreed. 104 (36.5%) of the respondents agreed that workplace violence can result in leaving/increased nurses intention to leave the job resulting in understanding, 80 (28.1%) strongly agreed, 60 (21.1%) disagreed, 31 (10.9%) were undecided while 10 (3.5%) strongly disagreed. 141 (49.5%) of the respondents agreed that post-traumatic stress disorder causing low productivity is also one of the effect of workplace violence, 74 (26.0%) strongly agreed, 50 (17.5%) disagreed, 10 (3.5%) were undecided while 10 (3.5%)

strongly disagreed. 112 (39.3%) of the respondents agreed that negative attitudes towards co-workers or other professionals can occur due to workplace violence, 84 (29.5%) strongly agreed, 54 (18.9%) disagreed, 18 (6.3%) strongly disagreed while 17 (6.0%) were undecided. 132 (46.3%) of the respondents agreed that negative attitude and poor tolerance to clients/relatives can occur due workplace violence, 69 (24.2%) strongly agreed, 44 (15.4%) disagreed, 32 (11.2%) were undecided while 8 (2.8%) strongly disagreed. 112 (39.3%) of the respondents agreed that poor communication and discontinuity of care is one of the effect of workplace violence, 90 (31.6%) strongly agreed, 45 (15.8%) disagreed, 22 (7.7%) were undecided while 16 (5.6%) of the respondents strongly disagreed.

Table 5: Showing Statistical Illustration of Difference in the Nurses' Perception of Workplace Violence in the Two Selected Hospitals

Variable	N	Mean	Std. Deviation	t-value	Sig.
Tertiary hospital	243	5.97	7.761		
Secondary hospital	42	2.46	4.012	8.739	0.686*

*not Significant at 0.05 level

Table 5 shows that there is no significant difference between perception of workplace violence among nurses at the two selected hospitals with (t-value = 8.739, p-value = 0.686 > 0.05). Therefore, the null hypothesis was accepted.

Discussion of Findings

Socio-demographic Characteristics of Respondents

This study revealed that majority of the respondents were between the ages of 20-30 years old with the mean age of 32.6 years which shows they were majorly young adults. Most of the respondents were females and were married which is expected of working class women in Nigeria. More than 80% of the respondents work at the tertiary hospital. This may be due to the fact that tertiary health institutions usually have a larger structural facilities and workforce than secondary hospitals. Majority of the respondents had 6-10 years' experience and

were NOII, NOI and SNOs. This is expected because other cadres that are higher than SNO were more involved in administrative responsibilities than clinical assignments and may not be involve in direct patient care.

Forms of Violence Experienced by Nurses

The findings from this study revealed that more than half of the respondents had been assaulted at their workplace and the assaults were mainly from patients' relatives. It was also found, that the commonest form of assault experienced was verbal assault. This corroborates with studies conducted in Gambia, China, South-western Nigeria and Cairo, Egypt where the commonest form of assault reported were verbal assaults and were mainly from patients' relatives. (Sisawo et al, 2017; Xing et al, 2015; Abodunrin et al, 2014; Samir et al, 2012). Furthermore, about one quarter of the respondents who had been assaulted did not react to or report the assault. This is similar to findings of Higazee and Rayan,

(2017) where victims of workplace violence did not report assault because they felt it was useless. However, the percentage in this study is lower compared to their study where 70% did not report the assaults. Agunwa (2018) buttressed that most incidence of workplace violence still go unreported and undocumented. This could be as a result of nurses viewing assaults or violence at the workplace as 'part of the job' as indicated by Ahmad, Masadeh, Al-Rimawi, and Atoum, (2015) who stated that majority of the nurses felt there was no need to report violence since there were no physical injuries involved and that violence was a normal part of the job. In another study by AbuAlRuband and Al-Asmar, (2014) it was revealed that nurses did not report violence because there was no procedure to report such incidents in the workplace for fear of losing their job or fear of adverse effect on customer service or due to inefficient responses received from previous reports which discouraged the nurses. Further Sato, Wakabayashi, Kiyoshi-Teo, & Fukahori, (2012) argued that lack of uniformity in accepted definition of violence has contributed to underreporting of workplace violence.

Perceived Factors Responsible for Workplace.

In this study, alcohol abuse or drug/substance abuse 224 (78.6%), long waiting hours 222(77.9%), highly stressed patients and relatives, 213 (74.8%), language or culture difference 204 (71.6%), inappropriate staff attitude 198 (69.5%), staffs' frustration 197 (69.2%), negligence of duty 196 (68.8%), bad leadership 183 (64.2%), role confusion between co-workers 183 (64.2%) and access to guns and other dangerous arms were the factors responsible for workplace violence. This is in line with the findings of Ulutasdemir and Tanir, (2017) who listed alcohol or substance abuse, long waiting hours, inappropriate staff attitude, stressed/frustrated patients and relatives as well as access to dangerous arms as factors precipitating the demonstration of violent behaviours.

Perceived Effect of Workplace Violence on Nurses' Job Performance

In this study, the results revealed that post-

traumatic stress disorder, poor communication and discontinuity of care, negative attitude towards co-workers or other professionals as well as patients and relatives were the major perceived effect of workplace violence identified by respondents. Similar to the finding of this study, Shaw, (2015) and Blythe, (2018) reported decrease work productivity, impaired job performance and reduced confidence on the job burnout, low morale, physical and emotional distress and job dissatisfaction as effect of workplace violence. Similarly, Reichert (2017) listed, increased intent to leave the organization, decreased job satisfaction, guilt, shame and avoidance as psychological consequences of workplace violence.

Statistical Relationship between Perception of Nurses at the Selected Hospitals

This study revealed that there was no significant difference between perception of workplace violence among nurses in the two selected hospitals, with p value of $0.686 > 0.05$. This is in contrast to the study conducted in Ghana by Bofo and Hancock, (2017) where significant relationship was found between type of hospital and workplace physical violence.

Implication to Nursing Practice

Nurses interact directly with people of different backgrounds, needs, social class and personalities. In the course of giving care or rendering nursing services they are frequently exposed to various hazards amongst which is violence which could be from a co-professional, a superior colleague, a patient or patient's relative, a total stranger or other health workers or staff. Nurses therefore need to have an adequate knowledge and skill in human relations, assertiveness, stress and anger management, which will go a long way in preventing violence. Nurses also need to learn the identification of indicators of violence and know the potential hazards or sources of violence in the workplace, breakaway or de-escalation strategies, and identification of emergency escape routes in case of a violent incidence. This will help protect the nurses against potential or actual violence and minimize violence related injuries, post-traumatic stress disorder, and other

psychological consequences of workplace violence.

In this study, effort has been made to discuss the factors responsible for workplace violence against nurses in selected government hospitals in Ilorin, Kwara State.

Conclusion

This study has been able to establish the forms of workplace violence experienced by nurses and the perceived factors responsible for it, as well as the effects of workplace violence on nurses' job performance. The study revealed that more than half of the respondents had been assaulted at their workplace and the assaults were majorly from patients' relatives. The commonest forms of assault experienced by respondents were verbal assaults. The major factors responsible for workplace violence were language or culture difference, high level of stress in patients and relatives, inappropriate staff attitude, staffs' frustration, substance abuse, long waiting hours, negligence of duty, and bad leadership as the major factors responsible for workplace violence. Therefore, there is need for government and hospital authorities to provide appropriate interventions to address these factors. Furthermore, there is need for reorientation of health care workers especially nurses on concept of workplace violence, as well as policies and procedure for reporting workplace violence and the ways to prevent it in health care setting.

Recommendations

Based on the findings of this study, the following are therefore recommended to the relevant stakeholders; Intervention to boost nurses/patient communication skills should be embarked upon to address the reported language/cultural issues capable of fueling violence. It is important that nurses always render quality care services to their clients and communicate effectively at all times to prevent anger and frustration. In addition, actions focusing on minimizing nurses' stress and burnout should be advocated for to reduce their frustration. Besides, supervision and monitoring of nurses by nurse leaders should be encouraged. This will checkmate the inappropriate attitude

and long waiting time. Nurse leaders should be committed to leading by good examples to junior colleagues. Policies and regulations should be put in place to address workplace violence and serve as a deterrent to potential violators. Cases of workplace violence should not be taken with levity in order to prevent future occurrences. Also, nurses should also always report cases of workplace violence and know when a situation is about to result in violence and prevent such escalation. Nurses should always involve the relatives in their care and carry them along on every development in the management of the client.

Moreover, clients and their relatives need to be oriented to the hospital routine, visiting hour, environment and protocol to prevent conflict and transfer of aggression. Furthermore, nurses should also communicate effectively with other health professionals that they work with and maintain good inter and intra-professional relationships. The hospital management should generate and implement policies against workplace violence and provide appropriate procedures for reporting violence and punishing the offenders. Also, there should be adequate security in place to protect the workers and clients from violence. Long waiting hours and payment before treatment policy should be addressed so as to provide emergency care to clients in dire need and prevent delays which could result in the death of patients and result in relatives' violence against the health workers. The recommendations should be in line with objectives and findings. They must be achievable and with action words. Although the result is faulty from analytical point of view, when corrected, the recommendations and findings must align.

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Factors Influencing the Practice of Holistic Care by Nurses in Selected Hospitals in Ondo State

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Abstract

Nurses have been educated with a fragmented biomedical allopathic focus and do not have a good understanding of the meaning of holistic care as a compelling evidence which suggested that nurses are not familiar with holistic care and in essence neglect this model of caring, do not engage in this method and get involved only in patients' physical needs ignoring the mental, spiritual and social needs of patients. This study assessed the factors that influence the practice of holistic care by nurses in selected hospitals in Akure, Ondo State. A descriptive research design was employed using purposive sampling method. Nurses were selected and a self-structured questionnaire was used to collect data. Data was analyzed using relevant tables and statistical calculations.

A pre-tested structured questionnaire was administered to 109 nurses using purposive sampling technique. A significant number of the respondents 35.8% within the ages of 26 to 30 years formed the highest population for the study. More than three quarters of the respondents (87.2%) have heard or learnt about the concept of holistic care. Also, 84.4% understand the concept of holistic care. The findings from this study also revealed that 68.8% of nurses believed that holistic nursing care is cumbersome to practice, it was also noted that 58% of nurses reported that the educational content and procedures while in school did not spell out holistic care in an extensive way. It was also noted that there are no adequate resources and the nurse-patient ratio is high. However, recommendations and suggestions calling the training and retraining of professional nurses and the nursing council should be sought to look into the curriculum of training to address the issue.

Keywords: *Holistic care, Factors, Practice, Nurses*

Introduction

An individual is made up of the body, mind and spirit and with respect to this concept would allow the nurse to encourage the individual patient in self-care which will lead to hope, self-autonomy, dignity, harmony, self-discipline, social growth life and energy (Thompson, Quinn, Paterson, Cooke, McQuigan & Butter, 2008). This care also includes a wide range of approaches, including medication, education, communication, self-help, and complementary treatment. (Morgan & Yoder, 2012). In holistic nursing, all aspects of patients and their effects on the treatment process are considered and the patients' thoughts, emotions, cultures, opinions, and attitudes are factored in as contributing to recovery, happiness, and satisfaction. (Selimen & Andsoy, 2011). Holistic care has been since the days of Florence Nightingale and she

developed this type of care as a better model of caring (Selimen & Andsoy, 2011). It is quite unfortunate that most nurses have been educated with a biomedical allopathic focus and do not have a good understanding of the meaning of holistic care as a compelling evidence which suggested that nurses are not familiar with holistic care and in essence neglect this model of caring (Selimen & Andsoy, 2011 & Olive, 2003), some do not engage in this method (Tjale & Bruce, 2007) and get involved only in patients' physical needs. In respect to this, patients' other needs and sometimes more grievous problems are not addressed (Olive, 2003). The mental, spiritual and social needs of patients are ignored (Porter, 1997) and patients are considered as biological machines (Kolcaba, 1997).

When an individual is ill, compounded psychological, social and cultural needs disrupt a patient's balance (Selimen & Andsoy, 2011) and goes a long way to affect his/her ability to carry out everyday activities (Newshan, 2004). In holistic care, addressing patients' physical, emotional, social and spiritual needs, brings back their balances and gives them the ability to deal with their illnesses and therefore improving their lives (Tjale & Bruce 2007). Using the ordinary medical model alone for treatment exposes patients to serious threats, prolonged hospitalization, and raises treatment costs (Olive, 2003). Similar studies conducted in the USA have revealed that 67% of American patients in hospitals do not receive holistic care (Daaleman 2008) and a study conducted in England showed that only 5% of hospitalized patients were subject to holistic care (Olive, 2003). The identification of contributory factors is of importance for providing this method of caring when bearing in mind the beneficial effects of holistic care. Literature shows that most studies have been narrowed to specific areas, such as operating rooms or the care of the elderly who were terminally sick (Selimen & Andsoy, 2011 & Choowattanapakorn & Nay & Fetherstonhaugh 2004). Other studies attempt to explain the concept of holistic nursing and nurses' perception of it (Strandberg, Ingvar & Borgquist & Wilhelmsson 2007, Tjale & Bruce, 2007) or the reasons for failure to employ this method. Holistic care is undesirably affected by factors as inadequate timing, improper professional relationship, incomplete reports from nurses, inadequate clinical control, unavailability of resources (Keegan 1987) poor professional and administrative perceptions, limited knowledge, and motivational and organizational factors (Selimen & Andsoy, 2011). This has brought great influence of holistic care on management and more effective nursing, the health-care systems in many countries in recent decades have tried to promote holistic care by spreading over changes to the educational and administrative systems (Selimen & Andsoy, 2011). It is so evident that there are other factors affecting holistic nursing that must be exposed on time. An investigation into this matter using a qualitative approach that includes multiple methods of data gathering and emphasising

reality experience (Strubert & Carpenter, 2007) can help us to obtain significant and broad data and this will noticeably clarify the existing background and the actual state surrounding the formation of holistic care.

When holistic care is understood by nurses in a comprehensive form, it will facilitate professional autonomy (McEvoy & Duffy 2008) and it will enable nurses to consider patients' needs in a more systematic and scientific way (King & Gate 2006, Baldacchino, 2008). Furthermore, a clear conceptual definition of holistic care will provide a consensus on its meaning thereby facilitating its application in nursing practice, research, education, and theory development.

Statement of Problem

Despite the global clamour for the use of holistic care as a panacea to the problem of poor nursing practice, most developing countries are yet to fully adopt this method. In Nigeria, most nurses have not come to terms with the practice of holistic care resulting in complications of illnesses and diseases. This can be due to inadequate timing, improper professional relationship, incomplete reports from nurses, inadequate clinical control and when resources are not available (Keegan, 1987) poor professional and administrative opinions, limited knowledge, motivational and organizational factors. (Selimen & Andsoy, 2011)

Objectives of the study

The objectives of this study were to:

1. assess the perception of nurses on the concept of holistic care.
2. assess the practice of holistic care by nurses in selected hospitals in Ondo State.
3. determine those factors influencing the practice of holistic care.

Research Questions

1. What is the perception of nurses about the concept of holistic care?
2. How do nurses practice the holistic care?
3. What are the factors influencing the practice of holistic care despite the knowledge about the concept?

Methodology

Research design

A descriptive research design was adopted which utilized self-administered structured questionnaire to assess the factors influencing the practice of holistic care by nurses in selected hospitals in Ondo State.

Sampling Technique and Sample

The population of this research were nurses practicing in the University of Medical Science Teaching Hospital Complex (UNIMEDTHC), Mother and Child Hospital (MCH) in Akure, Ondo State. There were one hundred and fifty nurses (150) in two hospitals respectively. Stratified sample technique was used to select the sample based on the characteristics of the population under study; Taro Yamen's formula was used to calculate the sample size:

$$n = N / 1 + N(e)^2$$

Where n= sample size

N=Total population

e=sample error=0.05

Population size of nurses in University of medical science teaching hospital complex=100

Population size of nurses in Mother and Child Hospital = 50

Total population=150

$$n = N / 1 + N(e)^2$$

$$n = 150 / 1 + 150(0.05)^2$$

$$n = 150 / 1 + 150(0.0025)$$

$$n = 150 / 1 + 0.375$$

$$n = 150 / 1.375$$

$$n = 109$$

$$100/150 \times 109$$

$$= 73 (\text{NURSES FROM UNIMEDTHC THAT WERE PURPOSIVELY SAMPLED})$$

$$50/150 \times 109$$

$$= 36 (\text{NURSES FROM MOTHER AND CHILD HOSPITAL THAT WERE PURPOSIVELY$$

SAMPLED)

$$73 + 36 = 109$$

The sample size of 109 nurses was determined for this study.

Instrumentation

The instrument used for the collection of data in this study was a self-structured questionnaire on the factors that influence the practice of holistic care by nurses in selected hospital in Ondo State. The questionnaire consists of section A, B, C, and D. Section A contains personal data of the respondent, section B contains information to assess the perception of the respondents about holistic care, section C contains the assessment of the practice of holistic care and section D contains information to determine the factors that influence the practice of holistic care.

Data Collection and Analysis

A self-administered questionnaire on the factors influencing the practice of holistic care by nurses designed by the researcher was used to collect data which was distributed to all nurses purposively.

Ethical Considerations

Ethical clearance was obtained from Ondo State Health Research and Ethics Committee with protocol number OSHREC/19/03/2019/115. All participants gave informed consent prior to data collection and necessary permission was taken from the institutions.

Results

Data was collected from nurses working at selected hospitals in Akure, Ondo State. The method of analysis was done by the use of frequency and percentage.

Table 1: Socio-Demographic Data of Respondents

Variables	Frequency (n=109)	Percentage (%)
AGE(in years)		
21-25	25	22.9
26-30	39	35.8
31-35	20	18.3
36-40	11	10.1
above 40	14	12.8
SEX		
Female	98	89.9
Male	11	10.1
EDUCATION		
RN/RM	40	36.7
Degree	60	55.0
Masters	9	8.3
PhD	-	-
WARDS		
Casualty	18	16.5
Medical	28	25.7
Surgical	29	26.6
Gynaecological	16	14.7
Paediatric	18	16.5
RANK		
Chief Nursing Officer	10	9.2
Assistant Chief Nursing Officer	11	10.1
Principal Nursing Officer	23	21.1
Nursing Officer I	30	27.5
Nursing Officer I	35	32.1
EXPERIENCE(in years)		
0-5	45	41.3
6-10	34	31.2
11-15	12	11.0
16-20	12	11.0
above 20	6	5.5

Table 1 shows the socio demographic characteristics of nurses studied. The age distribution of 109 respondents, 22% of the respondents were within the age of 21-25years, 35.8% were within the age of 26-30years, 18.3% were within the age of 31-35years, 10.1% were within the age of 36-40years while 12.8% of the respondents are above 40years. It also noted that 89.9% of the respondents were females while 10.1% were males. In addition, 36.7% of the respondents had RN, 55.0% had degree, 8.3% had their masters while none had PhD.

Furthermore, 16.5% of the respondents work in the casualty ward, 25.7% work in the medical ward, 26.6% work in the surgical ward, 14.7% work in the gynaecological ward and 16.5%

work in the paediatric ward. Also, 41.3% of the respondents have experience within 0-5years, 31.2% have 6-10years of experience, 11.0% have 11-15years of experience which is the same percentage with those who have 16-20years while 5.5% of the respondents have above 20 years of experience of practice.

Research question 1: What is the perception of nurses about the concept of holistic care? The above question was answered by determining the frequency count/percentage of each of the participants' responses to items on the perception of holistic care.

Table 2: Perception of Nurses about the concept of holistic care

	Yes F(%)	No F(%)	Indifferent F(%)
Is there any laid down rule or hospital policy for the practice of holistic care?	10 (9.2%)	54 (49.5%)	45 (41.2%)
Have you ever attended any lecture/seminar on the concept of holistic care?	59 (54.1%)	40 (36.7%)	14 (12.8%)
Have you heard or learnt about the concept of holistic care?	95(87.2%)	9(8.3%)	5(4.6%)
Did your curriculum in nursing school dwell more extensively on holistic care?	8(7.3%)	92(84.4%)	9(8.3%)
Good communication skills and professional commitment are the major principles of holistic care	80(73.%)	20(18%)	9(8.3%)
Is holistic care too cumbersome to practice?	75 (68.8%)	34 (31.2%)	
Do you think practicing holistic care is time-consuming?	76 (69.7%)	33 (30.1%)	
Does holistic care practice involve special training of nurses?	59 (54.1%)	50 (45.9%)	
Complications of illnesses and diseases can be minimized by holistic care.	99 (90.8%)	10 (9.2%)	
Holistic care should be treated as one entity and not a fragment of some procedures	75(68.8%)	34(31.2%)	

Table 2 shows that 87.2% of the respondents have heard or learnt about the concept of holistic care, only 8.3% have not and just 4.6% were indifferent about the knowledge of the concept. Also, it also reflected that 54.1% of the respondents have attended a lecture/seminar on holistic nursing care, 36.7% of the respondents have not while 12.8% were indifferent to attending any lecture on holistic care. The table also shows that 9.2% of the respondents are aware of a laid down rule or hospital policy for the practice of holistic care, while 49.5% of the respondents are not aware and 41.2% were not sure of the policy. Also, 84.4% of the respondent acclaimed that holistic care is not extensively spelt out in the nursing curriculum while 73.4% believed that good communication skills and professional commitment are the major principles of holistic care. 68.8% of nurses

attested that holistic care is cumbersome to the practice, while 31.2% respondents said it is not cumbersome to practice. Also, 69.7% of the respondents said that the practicing of holistic care is time-consuming and 30.1% of the respondents said the practice of holistic care is not time-consuming. Also, 54.1% shows holistic care practice involves special training of nurses. In addition, 90.8% of the respondents said that complications of illnesses and diseases can be minimized by practicing holistic care.

Research question 2: How do nurses practice holistic care? The above question was answered by determining the frequency count/percentage of each of the respondent's responses to items on the practice of holistic care by the respondents.

	YES F(%)	NO F(%)
Do you practice holistic care at any point during your shift?	24(22%)	85(78%)
Have you been able to carry out a holistic nursing care without hindrance(s) during your shifts?	36(33%)	73 (67%)
Have there been times when you and other members of the healthcare team discussed the treatment/management plan of the patients?	87 (79.8%)	19 (17.4%)
If holistic care is institutionalized, would you love to practice it without any hindrance?	89 (81.7%)	20 (18.3%)

Table 3 shows that 78% of the respondents do not practice holistic care while only 33% of the respondents have been able to carry out holistic care without hindrances during their shift and 67% have not been able to carry out a holistic care without hindrance(s) during their shifts. Also, 79.8% of the respondents have been involved with other members of the healthcare team in the treatment plan/management of their patients during ward rounds and only 17.4% were **not involved**. 81.7% would have loved to carry out holistic care without any hinderance.

Research question 3: What are the factors influencing the practice of holistic care despite the knowledge of the concept?

The above question was answered by determining the frequency count and percentage of each of the respondent responses to items on factors influencing practice of holistic care

	Agree F(%)	Disagree F(%)	Indifferent F(%)
No in-depth explanation and detailed content or procedure of holistic care in the Nursing educational / training curriculum	87(80%)	22(20.2%)	---
Individual updates & training influence the practice of holistic care more than experience	98 (89.9%)	4 (3.4%)	7 (6.4%)
Both intrinsic and extrinsic motivation of nurses can influence the practice of holistic care.	99 (90.8%)	7(6.4%)	3 2.8%)
Increased workload due to nurse to patient ratio influence the practice of holistic care negatively	95 (87.2%)	9 (8.3%)	5(4.6%)
Nurses being excluded from the treatment plan of patients have no effect on the practice of holistic care.	10 (9.2%)	94 (86.2%)	5 (4.6%)
Availability of adequate resources and equipment contributes to rendering holistic care.	96 (88.1%)	6 (5.5%)	7(6.4%)

Table 4 shows that 80% of nurses agreed that no in-depth explanation and detailed content or procedure of holistic care in the nursing educational / training curriculum while 89.9% of the respondents agreed that individual updates and trainings influence the practice of holistic care, 3.4% of the respondents disagreed while 6.4% were indifferent. Also, it can be deduced from the Table 3 shows that 90.8% of the respondents agreed that both intrinsic and extrinsic motivation influence the practice of holistic care, 6.4% of the respondents disagreed while 2.8% were indifferent.

Furthermore, 87.2% of the respondents agreed that increased workload due to inappropriate nurse-to-patient ratio is a factor that influences the practice of holistic care negatively, just 8.3% disagreed while 4.6% were indifferent. Just 9.2% of the respondents agreed that nurses being excluded in the treatment plan of patients have no effect on the practice of holistic care, 86.2% disagreed and 4.6% of the respondents were indifferent. It was also noted that 88.1% of the respondents agreed that availability of

equipment and resources contributes to rendering holistic care, just 5.5% disagreed and 6.4% were indifferent.

Discussion of Findings

The study revealed that majority of the respondents had the knowledge about the concept of holistic care either through fragmented modules on the concept, seminars, though few of the respondents have attended seminars or workshop on holistic care or experience on the job. This is in line with a study conducted by Pelzang, Wood & Black (2013) in Bhutan to explore the understanding and perception of patients oriented care among staff nurses, data was collected through mixed approach and survey questionnaires and the findings revealed that nurses had knowledge regarding patient-centered care but expressed the need to improve the knowledge through in-house training, workshop and seminars attendance.

Majority of the respondents claimed that there is a lay down rule guiding the practice of holistic

care and the turn out for attending seminars on holistic care is low. This is so surprising since the nurses' turn-up for seminars and workshop is low and they stressed that the curriculum of nursing did not dwell extensively on holistic care. Hence, the need to be worried on how the nurses practise holistic care in the hospitals and majority of the respondents said holistic care is cumbersome to practice. As such the practice of holistic care will be cumbersome because of the earlier report.

Furthermore, almost all the respondents said that the curriculum in nursing school did not dwell more extensively on holistic care during schooling: The content of educational programs is not based on the philosophy of holistic care. King and Gates' study points to the same results and shows that teaching holistic nursing to undergraduate nursing students is not available in the curriculum of nursing and the content of educational programs. (Frisch NC. 2007). Similarly, the results of Strindberg's study in Sweden show that most nursing education are based only on biological science. Revising nursing education seems to be vital for the inclusion of holistic care in nursing students. Strandberg has also suggested this matter in his study. (Strandberg, Ovhed , Borgquist , Wilhelmsson, 2007).

Based on the findings of this study that motivational factors are influential in identifying patients' various needs and generating holistic perceptions of the patient, almost all the respondents believed that this factor has a great influence on the practice of holistic care which in turn encourage nurses to attend to patients' diverse needs and provide holistic care. As a large percentage of the respondents believed that good communication trait and professional commitment are the major principles of holistic care. This is in line with previous studies that nurses who are invariably friendly and emotional tend to be happy at work and more capable of identifying patients' needs and nursing. Olive 2003, revealed that nurses, compared to their equals, are not only more dependable, intelligent, flexible, and conscientious, but also more highly motivated. (Berg & Sarvimäki, 2003) Good communication skills, professional commitment should be

stressed among nurses and they should be encouraged with incentives and proper and adequate salaries that will motivate them.

According to the findings of this study, most nurses believe that their main concern in their courses has been with becoming competent in doing routine tasks and that they had little opportunity to consider the other needs of patients. This can be traced to the ratio of nurses to patients in these settings, the ratio is 1 to 25-30 patients. majority attested that they do not practice holistic care in their various settings and also that they do not carry out holistic care and majority are willing to engage in holistic care if there are policies binding it in the hospital settings. Some factors that were identified in this study that influenced the practice of holistic care are: no in depth explanation and detailed content or procedure of holistic care in the nursing curriculum, individual updates and training influence the practice, motivation and availability of adequate resources.

Implication of the study for clinical practice

The delivery of the right care at the right time, concentrated on the needs of patients, requires a change in the work environment, as well as changes in the attitude of nursing practice and education, and in the amount of nursing staff for effective practice of Holistic care are; regular seminars and workshops and other equipment motivating nurses and employment of adequate and capable professional nurses, cooperation among nurses and regular supervision of the staff in implementation of the nursing process (Chudi Chukwuka 2013)

Conclusion

The study revealed that majority of nurses do not practice holistic care in these two settings and most of the respondents want to embrace the concept but there are barriers and factors that are delaying the utilization of holistic care approach despite the fact that there is adequate knowledge and the curriculum does not expand more on the concept.

Recommendations

Findings from this research are indications of the need for nurses to have adequate knowledge and right perception about the concept of

holistic care and to further update themselves to have adequate skills and understanding. They should also get fully involved in the treatment plan and management of their patients. Also, nurses should ensure that the rules and principles guiding every procedure are followed to minimize the occurrence of complication of illnesses. The Nursing Council has a whole lot to play in curriculum development of holistic care since it is the foundation of the knowledge received for holistic care. Lastly, more research should be conducted to update knowledge and skills about the concept of holistic care.

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Influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in social studies in Osun State Nigeria

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Abstract

The study determined the lower primary school pupils' performance in Social Studies. It also examined the relative influence of each teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies and finally examined the combined influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies. These were with the view to providing information on how the influence of each of teachers' professionalism, class size and instructional materials could bring about improved performance in Social Studies among lower primary school pupils in Osun State. The study employed descriptive survey design and the target population comprised the public lower primary school pupils and their teachers in Ife East Local Government area of Osun State. The sample size comprised 400 pupils and 40 Social Studies teachers. Ten lower primary schools were selected in the local government area using simple random technique. From each of the schools, forty (40) pupils from primary three were selected, using simple random sampling technique while four teachers were purposively selected from each school based on the fact that they were Social Studies teachers. Three instruments were used for the study. One research question was raised and answered and two hypotheses were tested and verified. Data collected were analyzed using Frequency Counts, Percentages, Bar Charts and Multiple Regression. The results showed that lower primary school pupils demonstrated moderate performance (57%) in Social Studies. The results also showed that teachers' professionalism ($t=2.653$, $\beta=.349$, $p=.012$) class size ($t= 2.439$, $\beta=.271$, $p=0.020$) and instructional materials ($t= -3.912$, $\beta=-.419$, $p=.000$) had significant influence on pupils' performance in Social Studies. Finally, there was significant influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies ($t= 33.391$, $P<0.05$). The study concluded that teachers' professionalism, class size and instructional materials are capable of enhancing academic performance in Social Studies among lower primary school pupils in Osun State.

Keywords: Teachers' Professionalism, Class Size, Instructional Materials, Lower Primary School, Pupils' Performance, Social Studies

Introduction

Education is the country's most noteworthy resource towards the brisk improvement of its economic potentials, sociological and human resources, subsequently, it centers around the integration of the people into sound and successful citizens (FRN, 2014). It likewise plans equivalent instructive open doors for all at primary, secondary and higher levels. Education has been the pillar whereupon all significant national improvements are constructed. It is the instrument which establishes the tone for development, improvement and comprehension of issues in all ramifications. For education to be applicable in a general public, it must be effectively communicated. Essentially, this must be accomplished through expert instructors, the utilization of good techniques

and reasonable instructional materials (Snoek, 2009).

Social Studies is fundamentally concerned about the study of individuals, their activities and connections, as they relate with each other and with their physical and socio-social condition with an end goal to meet their societal needs. Social Studies is inter/multi-disciplinary in nature and draws its topic from a variety of Social Science subjects like History, Geography, Political Science, Economics, Sociology, Anthropology and Social Psychology. Social Studies offers an imperative job of outfitting learners with skills and abilities to enable them to adapt to the present and future. This enables pupils to take part adequately in their world and clarify their association with different

individuals in social, financial and political issues (Jere, Janet, and Barbara, 2009).

The reason for primary school Social Studies is to empower the learners to comprehend, take an interest in, and settle on educated choices about their environment. Social Studies content enables the young ones to clarify associations with other people, organizations, and fortifies them with learning and comprehension of the past. It furnishes them with aptitudes for gainful critical thinking and basic leadership just as for surveying issues and making insightful and worthy decisions. Most importantly, it coordinates these abilities and understandings into a system for responsible citizens locally, nationally and all around. The instructing and learning forms inside Social Studies are remarkably sorted out to build up these limits starting with the most youthful students in our schools (Adeyemi, 2008).

In the event that the young learners of the society are to end up as powerful members in a democratic setting, at that point Social Studies must be a fundamental part of the educational plan all through the basic years. In a world that requests autonomous and helpful critical thinking to address complex social, financial, moral, and individual concerns, core Social Studies content is as essential for progress as reading, writing and computing. Information, abilities, and attitude necessary for educated and mindful cooperation in the public arena require a methodically-created rudimentary program concentrated on ideas from the four core social studies disciplines: civics, economics, geography and history.

According to Murung (2012), Social Studies is a procedure of training that gives children a chance to connect with other individuals and the general public in their environment. Learning environment is the physical condition in a school setting, for example, school offices, equipment, school practice, for example, making offices accessible, a portion of staff to show essential training and methodologies to advance support. Social Studies contents require significant educating, intelligent arranging, guidelines, and appraisal. Okojie (2005)

detailed that safe and orderly classroom environment and school facilities were significantly related to student academic performance in Canadian schools. Small classes and teacher quality improve teaching and learning condition (Adeyemi, 2008).

A study by Dudeck, (2000) on academic performances in primary schools explains that school teaching and learning materials helps great scholarly practices in the classroom. The study expresses that academic achievement comes through compelling administration, training and information where learners and instructors are furnished with appropriate utilization of instructional materials. Proper utilization of teaching – learning materials is basic to learning and numerous investigations support that there is a strong connection between utilization of instructional materials and execution. Omabe (2006) was of the opinion that the use of teaching and learning materials, for example text books help instructors gather proficiency associations with social Studies as a subject.

The instructor as an expert is a teacher and a specialist in learning and skills. Being a successful specialist and investigator who, through instructional training, is skilful in applying hypothetical information in different educational settings. An instructor gives instructions to teach, for learning, for character, for development, for individual satisfaction and stylish refinement. The professional understands the focal ideas, apparatuses of request, and structures of the order the person in question educates and makes learning experiences that make these parts of topic important for investigation. He/she sees how children learn and create and can give learning openings that help their intelligence and their social and self-awareness. He/she likewise comprehends and utilizes a variety of instructional materials to support students' improvement of basic reasoning, critical thinking and execution abilities. Teachers are capable of inspiring students' learning and thinking (Crook, 2008).

Possibly, the most disturbing issue in the present early childhood training in Nigeria is the

inadequacy of qualified teachers to teach the young ones. Numerous early childhood centre proprietors seriously underpay their staff, which contrarily influences the employment rates. Those educators that consent to the low pay are frequently unfit for the job needing to be done. Obviously, there is consistently an alternative of a private nursery school. They utilize instructors that really have the correct capabilities and the degree of professional skill. By and by, not such a significant number of individuals can stand to pay the education costs. Accordingly, they must choose the option to manage shoddy learning conditions for their children. The greater part of the early childhood instruction establishments do not just give average training, yet they additionally cannot offer conventional consideration for youngsters. Numerous educators are not actually qualified for their positions. This means that huge numbers of them do not have the full idea how to manage children by any means, particularly with children that are about three years of age (Evetts, 2009).

Odhiambo (2005) argues that there is a developing interest from the government and general public for teachers' professionalism. Schools are usually assessed based on pupils' academic achievement (Heck, 2009). Instructors cannot be separated from the schools where they instruct and the scholarly consequences of those schools. It would along these lines be wise to utilize standardized students' appraisals results as the basis for making a decision about the presentation of instructors. Instructors are celebrated and are compensated when their schools and teaching subjects are profoundly positioned. In Chile, for example, instructors are remunerated, all things considered, when they work in schools which are recognized as high-performing by the National Performance Evaluation System of Subsidized Schools (Organization for Economic Cooperation and Development, 2005). In Kenya, instructors who exceed expectations in their teaching subjects are compensated during open training day held yearly in each region (Mbugua, 2012). While valuing the benefit of remunerating educators who produce better outcomes, instructors ought to likewise be held responsible when their

students perform inadequately.

The connection between class size and academic achievement has been a fascinating one for researchers. Studies have discovered that the physical condition, class size and instructional materials are on the whole factors that influence students' accomplishment (Kimani, Kara, & Njagi 2013). Different components that influence students' accomplishment are the population of schools and class size (Barab, Gresalfi, & Ingram-Goble, 2011 and Lilian, 2015). The issue is so that it has prompted the decrease in standard of instructional delivery. Since the scholastic accomplishment of students depends, to a great extent, on the school environment, stuffed classrooms have expanded the conceivable outcomes for mass failure and make students lose enthusiasm for school exercises. This is on the grounds that large class sizes do not enable individual student to get consideration from instructors which constantly leads to low reading scores, frustration and low morale in scholastic execution.

Albeit a few outcomes demonstrate that smaller classes advance higher accomplishment in early primary school, the more extensive study on class-size impacts is mostly not concluded. Notwithstanding, not many early childhood education establishments have enough professional staff to deal with the children. The endorsed proportion of instructor to student is 1:25. And for some schools, this proportion is not practicable, which is the reason the classes are overpopulated, and numerous children do not get the consideration they merit. Simultaneously, this issue lies further, as not unreasonably numerous individuals need to seek after a calling in early youth instruction in any case. They perceive how terrible things are, so they settle for something increasingly steady and beneficial. A few investigations recommend that smaller classes and higher staff-pupil proportions are better for young children, permitting increasingly individual consideration, lessening the time and exertion committed to classroom the management, and decreasing the quantity of unpleasant communications. Obviously, nobody truly

accepts that it doesn't make a difference what number of pupils is stuffed into a classroom (Adeyemi, 2010).

Decreasing class size has customarily been viewed as a significant method to improve students' learning experience. Numerous general opinion studies have demonstrated that both educators and guardians support smaller class sizes. Instructors who take to the streets are frequently looking for lower class sizes, among other better working conditions. Majority generally accept that smaller classes would allow instructors to give increasingly close-to-home attention to the learners. This can hypothetically prompt improved scholastic outcomes for the learners. The National Education Association, or NEA, is an American worker's organization that speaks to 3 million instructors working at government funded schools and universities in the United States. The association is agreeable to littler class measures in U.S. schools. For instance, the NEA has required a class size of 15 pupils in early grades of regular school programmes. The NEA says it accepts little class size results in more prominent student accomplishment.

Instructional materials are those materials utilized by an educator to improve their instructing. They incorporate both visual and audio-visual media and could either be concrete or non-concrete. These instructional materials carry life to learning by stimulating understudies to learn. The utilization of instructional materials in the classroom can possibly enable the educator to clarify new ideas clearly, bringing about better learner comprehension of the ideas being communicated. Be that as it may, they are not finishes in themselves but rather they are unfortunate chore (Kadzera, 2006). It is accepted that great instructing materials can never replace the instructor, yet the educators utilize them to accomplish their teaching and learning goals. Instructional materials extend from home made gadgets to advanced machines and furthermore individuals who help the instructor in dispersing information and information to enable students to learn effectively (Ololobou, 2008). Therefore, the

significance of the utilization of these materials cannot be overemphasized.

The most effective instructional materials can never replace the instructor yet the educator utilizes them to accomplish their teaching and learning goals. A portion of the instructional materials fundamental for viable teaching and learning of Social Studies includes the blackboard, models, charts, outlines, maps, pictures, graphs, kid's shows, slides, filmstrips, radio, and TV (Kochhar, 1991). This has been underlined by various researchers. Lockheed and Verspoor (1991) says that instructional materials are basic fixings in learning and that the educational plan couldn't be effectively executed without them. Instructional materials are fundamental since they help the educator and students stay away from overemphasis on recitation and repetition. To guarantee quality instructional conveyance to assist educator and student, fundamental training requires the suitable utilization of a reasonable blend of print, sound, visual, broad media and different materials. These materials incorporate; course readings, journals, magazines, periodicals, postal, divider outline, maps, globes, filmstrips, pictures, slides, projectors, charts, radio, recording devices and TVs. (Oluwaghohunmi & Abdu-Raheem, 2014)). A portion of the itemized materials like pictures, notices, graphs and globes claim to the feeling of sight (visuals), while some like TV, movies and slide projector are sound visuals, offer to both feeling of sight and hearing.

Garba (2004) states that instructional materials help to blend any differences between the real world and the abstract. For powerful instructional conveyance, the instructor is urged and expected to adequately use applicable instructional materials. Such materials make the teaching and learning process all the more fascinating, increasingly successful, livelier, and speaking to the student, instructional conveyance more straightforward and simpler.

Statement of the Problem

The early years of children are widely accepted as the most essential period during which

children experience cognitive, language, perceptual, socio-emotional and motor development which will be necessary for their future accomplishment and social functioning. Social studies as one of the major subjects taught in the primary school level suggest the importance to the government, parents and the society at large. The Federal Government of Nigeria is now responsive to early childhood education by virtue of its inclusion in the Universal Basic Education (UBE) programmes. This constitutes a step in the right direction in the provision of good early childhood education. Yet, some important cases need to be considered if the objectives of this system are to be achieved. Among such issues are teacher professionalism, class size and the use of instructional materials.

Purpose of the Study

The purpose of the study is to examine the influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies in Ile-Ife, Osun State.

The objectives of the study are to:

- (a) determine the lower primary school pupils' performance in Social Studies;
- (b) examine relative influence of each of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies; and
- (c) examine the combined influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies.

Research Question

What is the performance of lower primary school pupils in Social Studies in Ile-Ife, Osun State?

Hypotheses

1. There is no significant relative influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies.
2. There is no significant combined

influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies

Methodology

Research Design

A descriptive survey design is utilized. The study is a descriptive study because it adopted the use of questionnaires. The variables studied are teachers' professionalism, class size, instructional materials and pupils' performance in Social Studies.

Population, Sample and Sampling Technique

The target population is all the public lower primary school pupils in Ife East Local Government Areas of Osun State, Nigeria. Ten lower primary schools were selected using simple random sampling technique. From each of the schools, forty pupils from primary three were selected using simple random sampling technique while four teachers were purposively selected from each school based on the fact that they are Social Studies teachers. In all, we have 400 pupils and 40 Social Studies teachers that made up the sample for the study.

Research Instruments

Three self-designed research instruments were used for the study namely:

1. Teachers' Professionalism Questionnaire (TPQ);
 2. Instructional Material Inventory (IMI) and
 3. Pupils' Performance Record (PPR).
1. Teachers' professionalism Questionnaire (TPQ)

This instrument is a Questionnaire which consists of two sections namely; section A and B. Section A measures the demographic characteristics of the respondents. This includes sex, religion and ethnicity. Section B consists of items measuring professionalism in teachers. Teachers are asked to respond to a 4-point rating scale ranging from Strongly Disagree (1) to Strongly Agree (4); with high scores indicating a positive or favorable response. Negative worded items were reversed and total score for

the scale was generated. It consisted 15 (fifteen) items.

2. Instructional Materials Inventory (IMI)

This was constructed and carried out by the researcher to examine teachers in the course of teaching and determine their level of utilization of instructional materials. This consisted fourteen (14) items. The scale adopted a 4 point rating scale ranging from GE= Great Extent (4) to NL= Not at All (1) with high scores indicating a positive or favorable response.

3. Pupils' Performance Record (PPR)

PPR entails Social Studies Examination result of the pupils for three terms which was collated by the teacher and the average was computed. The highest score was 87 and the lowest score was 12. The investigators ensured that in the schools used for the study, all the teachers were available and taught the pupils throughout the session.

Validity of the Instruments

In order to measure the extent to which the survey instrument has been able to achieve its aims, the process of content validity is employed by cross-examination and verification. Only items that are relevant and valid constitute the contents of the questionnaire and the inventory. The validity of the instrument was ascertained by giving out copies of the draft questionnaires, draft inventory, research questions, hypothesis, alongside with the purposes of the study. The suggestions and recommendations of the experts were used to correct the drafted questionnaire and inventory.

Reliability of the Instruments

The instruments were pre-tested on 10 random lower primary school teachers to ensure reliability. After the pre- test, the instruments were scrutinized and necessary modifications are made before the final administration of the questionnaire and inventory. Each instrument

was checked and all ambiguities and irrelevances deleted. The data was analyzed using Cronbach's Alpha to determine the reliability of the instruments. Teachers' Professional Questionnaire yielded a reliability coefficient of 0.82 while Instructional Material Inventory (IMI) yielded a reliability coefficient of 0.78. It was then adjudged that the instruments were reliable for gathering the intended data.

Procedure for Data Collection

To administer all the instruments constructed for the study, the researcher visited the schools, discussed with the Head Masters/Head mistresses, and obtained their consent before meeting with the teachers. One Social Studies teacher in each school (research assistants) was instructed for a day on the use of the rating scale by the researcher for the study. Thus, the researcher along with the trained research assistants numbered the instruments before administering them in all sampled schools. TPQ was administered to the respondents and retrieved back from them to elicit necessary information needed in the study area. Instructional Material Inventory (IMI) was attended to and ticked by the researcher in the schools to collect data on the teachers' level of utilization of Instructional Material.

Methods of Data Analysis

The descriptive statistics such as frequencies, percentages and graphs are used for the analysis of research questions while the hypotheses testing were done with Multiple Regression; SPSS (Statistical Package for Social Sciences) computer software was used to run the analyses. The hypotheses were tested at 0.05 level of significance. At 5% level of significance, reject null hypotheses for tests with probability estimates lower than 5% (0.05) and conclude that they are statistically significant. Otherwise, we accept (when probability estimates are above 0.05) and conclude that there is no overall statistical significance.

Results

Demographic Profile

The descriptive statistics of ethnicity, gender and religion is represented in Table 1

Table 1: Frequency Distribution of Teachers

Variables	Frequencies	Percentage (%)
Ethnicity		
Yoruba	28	70.0
Hausa	2	5.0
Igbo	10	25.0
Total	40	100.0
Gender		
Male	10	25.0
Female	30	75.0
Total	40	100.0
Religion		
Christianity	20	50.0
Islamic	18	45.0
Others	2	5.0
Total	40	100.0

The summary of the results in Table 1 shows that the teachers' ethnicity were divided into three categories of which 70.0% are Yoruba, 5.0% are Hausa and 25.0% are Igbo. Also, male teachers are 10 of the total respondents representing 25.0%, while female teachers are 30 representing 75.0% of the total valid responses. 50.0% of the respondents are Christians, 45.0% are Muslims, and 5.0% of them belong to other religions.

It is therefore implied that majority of the respondents are Yoruba, female teachers participated more than male teachers and, majority of the participants practice Christianity as a religion.

Research Question 1: What is the performance of lower primary school pupils in Social Studies in Ile-Ife, Osun State?

To answer this question, Social Studies Examination of the pupils for three terms was collated by the teacher and the average was

computed. The mean and standard score of the group score were 46.31 and 15.82 respectively. Scores below the group mean score were considered as having a low performance. Scores within the mean score and one standard deviation above the mean score (i.e. 46.31-62.13) were considered as moderate performance while those with scores of 62.2 and above were considered as high performance. The result is presented in table 2 below.

Table 2: Descriptive Statistics of lower primary school pupils Performance in Social Studies

Performance	Frequency	Percent (%)
High	72	18.0
Moderate	228	57.0
Low	100	25.0
Total	400	100.0

Table 2 shows that 57.0% of the pupils had moderate performance in Social Studies. Also, 25.0% of the pupils had low performance while 18.0% of the pupils were found to have high performance. There is an indication from this result that more than 50% of the pupils that participated in the study demonstrated moderate performance in Social Studies.

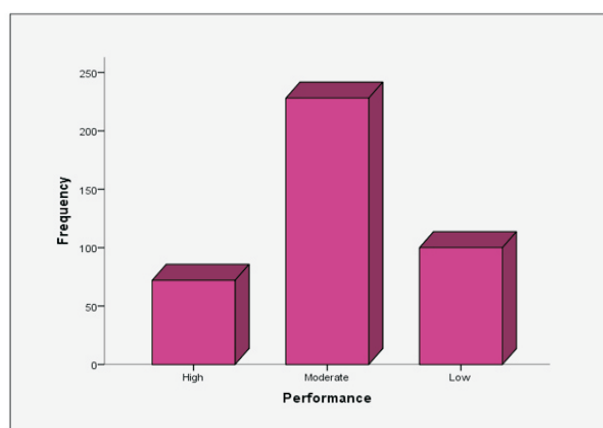


Figure 1: Bar-Chart of lower Primary school Pupils' performance in Social Studies

Figure 1 clearly shows that moderate has the tallest bar. Hence, lower primary school pupils have a moderate performance in Social studies in the study area.

Hypothesis 1: There is no significant relative effect of teachers' professionalism, class size and instructional material on lower primary

school pupils' performance in Social Studies in the study area.

To answer this hypothesis, out of 400 pupils, the average of 10 pupils' Social Studies

performance score was calculated one after the other and recorded and 40 pupils' scores were obtained. This was used in conjunction with the original 40 teachers used in the study.

Table 3: Relative influence of independent variables on lower primary school Pupils' Performance in Social Studies

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	48.729	7.763		6.277	.000
	Teachers' Professionalism	.351	.132	.349	2.653	.012
	Instructional Materials	.274	.112	.271	2.439	.020
	Class Size	-.564	.144	-.419	-3.912	.000

Table 3 reveals the relative influence of the three independent variables to the dependent variables, expressed as beta weights. Teachers' Professionalism have a significant relative influence to the academic performance of Social Studies of lower primary school pupils ($t= 2.653$, $\beta=.349$, $p=.012$). This implies that this aspect of the null hypothesis was rejected as the significance level was less than 0.05. Similarly there was a significant relative influence of Instructional materials to the academic performance of Social Studies of lower primary school pupils ($t= 2.439$, $\beta=.271$, $p=.020$) thus the null hypothesis was rejected as the significance level was less than

0.05. Also, Class Size have a significant relative influence to the academic performance of Social Studies of lower primary school pupils ($t= -3.912$, $\beta=-.419$, $p=.000$). This implies that this aspect of the null hypothesis was rejected as the significance level was less than 0.05. Results in the table above shows that Teachers' Professionalism, Class Size and Instructional materials had a significant influence on pupils' performance in the study.

Hypothesis 2: There is no significant combined influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies in the study area.

Table 4: Summary of regression for the combined influence of independent variables on lower primary school Pupils' Performance in Social Studies

R=.858

R Square=.736

Adjusted R²=.714

Std. Error=7.622

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5820.122	3	1940.041	33.391	.000
	Residual	2091.653	36	58.101		
	Total	7911.775	39			

Table 4 reveals significant combined influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies. The result yielded a coefficient of multiple regressions $R = .858$ and multiple $R\text{-square} = .736$. The R -value of $.858$ represents the multiple correlations between the study variables. The $R\text{-square}$ value of $.736$ represents the total variability of the dependent variable as explained by the independent variable. Based on the Adjusted $R\text{-square}$ value of $.714$, it follows that 71.4% of the total variability in the performance test of Social studies lower primary school pupils is explained by the variable of Teachers' Professionalism, Class Size and Instructional materials. The ANOVA result from the regression analysis shows that there was significant influence of the independent variables (Teacher's Professionalism, Class Size and Instructional materials) on the Pupils' performance in Social Studies, $F(3, 36) = 33.391, P < 0.05$.

Discussion of Findings

This study investigated the influence of teachers' professionalism, class size and instructional materials on lower primary school pupils' performance in Social Studies in Osun State. The findings of this study showed that 57.0% of the pupils had moderate performance in Social Studies. This contradicted the findings of Adeyemi and Akinboyewa (2019), who examined the learning outcomes in Social Studies and parental involvement of lower primary school pupils in Ondo state, Nigeria who were of the view that 47.9% of the pupils performed below average in Social Studies. This might be as a result of the emphasis placed on teachers' professionalism, class size and instructional materials which are crucial in bringing about improved performance among learners.

The findings also showed that teachers' professionalism, class size and instructional materials had both significant relative and combined influence on the academic performance of Social Studies among lower primary school pupils. This finding tallied with the findings of Kimani, Kara, & Njagi

(2013), who examined how teachers' factors could influence students' academic achievement in secondary schools in Nyandarua county, Kenya and eventually came out with their findings that variables such as gender, age, professional qualifications, professional experience and instructional practices had significant influence on students' academic achievement. This is to say that for effective performance, in any given subject, teacher professionalism combined with instructional materials could go a long way in bringing about better performance in learners.

Conclusion

The study concluded that teachers' professionalism, class size and instructional materials are capable of enhancing academic performance in Social Studies among lower primary school pupils in Osun State.

Recommendations

- Teachers who are closer to the students than other stakeholders should be provided with opportunities for professional growth. This may be done by sponsoring regularly the teachers to attend workshop, seminars and granting them to study with pay if they wish to go for further studies. This is also by giving the teachers more responsibilities by allowing them to handle different classes and assigning them other duties.
- Teachers should use their academic and professional experience to help pupils to improve in their performance as they transit from lower to upper levels in the primary education cycle.
- All teachers should use a variety of teaching and learning resources in all classes during all teaching and learning sessions to make it more real and practical.
- The government should increase the funding of schools so as to cater for the essential teaching/learning aids. This may help create a generation that is well educated in the future community.
- As for pupil-teacher ratio, the Teachers' Service Commission needs to employ more teachers to curb shortage of teachers in lower primary schools.

Proper balancing of teachers needs to be done where there could be over staffing. This may help to enhance pupil teacher ratio thus improving pupils' performance.

Limitation of the Study

The major limitation of the study was the time allotted by the schools that were used in carrying out the research. The study requires ample time in order to explore all the steps that were required. Nevertheless, with the help of the research assistants, who were adequately trained, success was eventually achieved in getting good results from the research.

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Assessment of parental attitude towards the introduction of sex Education in Junior Secondary School curriculum in Oyo State

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Abstract

Sexual and reproductive health issues are fraught with many challenges. Some challenges include but are not limited to; unwanted pregnancies, sexually transmitted diseases, abortion and promiscuity. These are likely traceable to poor school performance, mental health issues, school drop-outs and psychological issues for the adolescents. Therefore, this study investigated "Assessment of Parents' Attitude towards the introduction of Sex Education in the Junior Secondary Schools Curriculum in Oyo State, Nigeria". Descriptive Survey Research design was used for the study, with sample size of 200 male and female parents, purposively selected for the study. A self-developed questionnaire with ($r = 0.76$) was used to elicit response from the participants. The result ($x = 2.92$) showed that 65% of parents approved the introduction of sex education into the school curriculum. Also, 75% ($x = 3.49$) indicated their willingness for sex education to be taught as a subject in the school. In addition, male and female opinions do not differ (minimal) on the inclusion of sex education into the curriculum ($t(198) = 2.349$, $P \leq 0.407$), male ($x = 75.30$), female ($x = 73.40$). Based on the findings, parents should be intimated concerning any information related to sex education in schools and teacher's teaching should possess adequate knowledge of the subject. It is therefore, recommended that sexuality education curriculum should contain in it learning preferences; images and materials should be appropriately used.

Keywords: Assessment, Parental Attitude, Sex education, School curriculum.

Introduction

Sexuality is naturally being human and fundamental to human existence which cut across all ages. It forms a central aspect of human living which is expressed in thoughts, feelings, desires, beliefs, values, behaviors and activities. Establishing relationships could be influenced by the individual, family, culture, religion, laws, professions, institutions, science and politics. Sexuality involves sensuality, intimacy, sexual identity, sexual health and reproduction, as well as *sexualization*. Knowledge and attitude about sex is so germane to human existence to the extent that people seek information about it from any available source, whether good or bad. And, when accurate information is not readily available, they ignorantly accept wrong information for truth. Considering the trend in technological advancement and globalisation, the rate at which today's youngsters (adolescents) have access to sexual information through internet, media and other sources underscores the fact that they need proper information about sex. So,

the introduction of sex education to our young folks should not be considered too early.

AHI (2003) described sexuality education as a planned process of education that brings about acquisition of factual information. This informs the positive attitudes, beliefs and values as well as development of skills to cope with every aspect of human sexuality. Oyetade (1999) opined that sexuality education is encompassing; that is, biological, socio-psychological and spirituality of sexuality from the three domains of humanity namely, cognitive, affective and behavioral (psychomotor) domains, and the skills to communicate effectively to make responsible decisions. Sexuality education is viewed as a lifelong process, spanning every stage of development from childhood to adulthood. Therefore, the adolescents, who are mostly found in the secondary schools and undergraduate level in higher institutions, have the right to be informed and be educated about safe, effective, affordable, and acceptable ways

of making right choices as regards fertility regulations.

Sexuality education focuses mainly on the promotion of sexual health by providing learners with opportunities to develop a positive view of sexuality in order to prevent social problems. Evidence in research showed that making a case for abstinence alone, as regards information about sex education is like burying one's head - only sex education is like burying one's head in the sand which denies the realities of human life in general. For the average teenage, who is in the stage of romantic desires, sexual curiosity, and rapid maturing bodies, abstinence education overlooks the basic truths about human sexual development and teenage realities. As such, it is hardly the best approach for our youth, especially those who are sexually active (Kelly, 2018).

Comprehensive sex education does not encourage our young ones to have early sex. Comprehensive programs give students realistic and factual information about the safety of various sexual practices, prevention of unwanted pregnancies and sexually transmitted diseases (STDs). In actual fact, it is the parents' job to teach their young ones their standards for moral behavior and moral ethics of the society. Therefore, giving adolescents accurate picture of the risks of different types of sexual behavior can help in making good decisions about sex. The more they know, the more they are likely to be affirmative in taking decisions about sexual activities (Boskey, 2019).

Contrary to popular opinion, comprehensive sexuality education encompasses much more than human anatomy and discussion about sexual practices. It also offers interpersonal skills and self-awareness on important ways of handling relationships. Programs for pre-adolescent children should teach accurate words for body parts and help them to recognise basic features or characteristics of healthy relationships, such as respect and kindness. Also, it addresses the physical boundaries, giving student's adequate knowledge and equipping them to recognise unwanted touch, predatory behaviors and how to seek help from

trusted adults in case of any error or intimidation. Programs for teens or adolescents should not address body changes alone, but also help them to critique our culture's hyper-sexualisation of bodies. Comprehensive sexuality education seeks to efficiently prevent unplanned pregnancies, sexually transmitted infections, abortion and other complications.

Eleanor Harding remarked in Daily Mail, February 2017 that lack of sex education is like a healthy time bomb and warned that too many teenagers are being infected with STIs because of poor information in schools. According to daily mail U.K. report, the Local Government Association (LGA) reported that too many of these youngsters are still being diagnosed with sexually transmitted infections (STIs) due to poor information in schools. Official figures show there were 78,066 STI diagnoses among 15 to 19-years-olds in England in 2015, and 141,060 among 20 to 24 years-olds. Therefore, sex education was made compulsory in all secondary schools in order to combat high number of cases of STDs/STIs. Justine Greening is making the subject mandatory to tackle online grooming, sexting and youngsters viewing internet porn. Similarly, the United States continues to have the highest teen pregnancy rates among developed countries. It was discovered that among the 750,000 teen pregnancies reported each year, approximately 400,000 result in live births, and over 80% are discovered to be unintended (American College of Obstetricians and Gynecologists, 2008).

In Zambia, a new Framework on Comprehensive Sexuality Education (CSE) in 2014 were put in place, targeting school children and adolescents in grades 5 – 12 (Birungi, Undie, Machenzio, Kata-hoire, Obare, PM, 2015; Population Council, Zambia Human Rights Commission, WLSA UN, 2017; UNESCO, 2016; MoE, 2014). The aim is to address inadequate knowledge on sexual and reproductive health (SRH) and their related problems (Zambia Demographic and Health Survey 2013-2014; Zulu, Goicolea, Kinsman, Sandoy, Blystad, Mulubwa, 2018; Zulu, Ali, Hallez, Kass, Michelo, Hyder, 2018). In a study by a group of researchers, it was discovered that

25% of married girls aged 15-19 have insufficient knowledge on family planning, 30% within the same age bracket have started child bearing, and 31% which falls within age 20-24 are reported to have married before age 18. There was an act since in prohibiting termination of pregnancy or abortion. As a result, the adolescents were face with abortion related complications as at the time of the study. Unfortunately, the teachers that were meant to teach CSE under the new scheme indicated they couldn't teach them everything in the curriculum because of certain concerns about their beliefs and society at large (Zulu, Blystad, Haaland, Moland, Michello, Haukens, 2018). All these research evidence revealed lots of global issues on adolescents' sexual and reproductive health.

Adepoju (2005) stated that the youngsters who are found in the ages 10-24 and 36.7 percent of the Nigerian population, are highly vulnerable to antisocial behaviors like violent crimes, unsafe sexual practices and drug abuse, to mention but a few. Due to religious and cultural sensitivities, Nigerians live in denial of just how rampant teenage sex is. The Demographic Health Survey (DHS) in 2013 revealed that, only three in ten women are reported to have had, first sexual intercourse at the age of 20 or later, while 54% said they had done so before turning 18 and 24% indicated that they had not even been 15 at the time of first intercourse. The DHS (2013) also showed that two percent (2%) of sexually active girls between 15 and 19 years use contraceptives while others said they did not have access to it. Unfortunately, 23% of the girls in this age group (15-19) have children; some girls get pregnant because of voluntary early sex and pressure while others are sexually abused or forced into early marriage. Generally, most lack proper sex education and information on contraceptives (condoms at least). Inexperienced teenagers hardly demand that their male partner wear a condom, all too often, they are shy and taken advantage of.

Teenage pregnancy is fraught with many complications or consequences. Research findings show that some drop out of schools, and do not acquire any skills that would help them

bolster their financial status, thus, ending up in unpalatable marriages, having ailments like vaginal Fistula due to lack of antenatal and postnatal care. To worsen the case, they become incontinent and ostracised by the society (Oyetade, 1999). There are many reports of teenage girls experimenting with various dangerous concoctions in order to prevent or abort pregnancy because they cannot afford hospital bills. Besides, abortion is illegal in Nigeria. Unsafe abortion complications are also too many. The National Population Commission (NPC) in 2013 warned that the number of teenage mothers in Nigeria may increase to 60 million by 2015 if care is not taken; demanding aggressive steps to stop the trend. Hence, comprehensive sexuality education could make a difference since most of these teenage mothers are in their adolescence period.

Adolescence has been described as a stage whereby a lot of physiological and biological changes take place resulting in reproductive maturity in the adolescents. Kulkarni (2008) explained adolescence as a period of physiological development beginning from the pre-teen years with pubertal onset, extending till the individual assumes an adult role in the society. Adolescents experience mood swings, become emotionally unstable, alternate between extreme cooperation and extreme resistance to adult guidance. As pubertal period emerges, sexually, early adolescents may engage in masturbation and other pleasurable self-stimulation. They are very close with same or opposite sex peers and may experiment sexually with them, usually to satisfy their curiosity and establish their sexual identity role as a presumed adult. These, at times, make them rebellious to adults' instructions or guidance. Naturally, by the time they are 18, most adolescents are sexually active, Nigerian adolescents are not an exception, and that is why sex education is highly imperative.

Okonkwo and Eze (2000) observed that today's situation contradicts old traditional Nigerian society in which girls avoided pre-marital sex for fear of social punishment meted out on girls and their families for losing their virginity before marriage. Many people fault the parents

on this issue because parents are supposed to educate their young folks on sex and sexual related matters. Unfortunately, the traditional society is quite conservative on 'sex matters'.

Durojaiye (2005) observed that in most African homes, parents are not fully equipped to answer questions on sexual matters. Those who make an attempt, pass on faulty information to their children. Sprecher (2008) opined that since sex education is rarely received from parents, adolescents look to other sources for knowledge. Adolescents learn more about sex from peers, specifically dating partners, same- sex friends and other sources. Kim and Ward (2007) reported that, parents are at vantage position to give sex education to their children because they are the earliest socialisation agents in children's lives. However, the negligence of parents about this particular issue in providing appropriate information to their children has been a great concern to many people. Whereas, research findings from different parts of the world about young peoples' sexual behavior revealed that they would have loved or preferred their parents' to educate them first about sexuality matters. The lackadaisical parental attitude could be attributed to parents' low educational background, level of exposure or the prevalent traditional beliefs and culture. (Oyetade, 1999).

However, schools have been mostly suggested by parents as the best institution adequate for teaching sex education (Elemide, 1978; Akinrolabu, 1985). Although, the Federal Government of Nigeria in 1999 through the National Council on Education incorporated sex education into the National Curriculum in Junior Secondary School but met with resistance by some forces (parents, religious leaders, cultural variation, etc.). Welshimer and Harris (1994) stressed the need for educators to study the attitudes and values of the community (parents) in order to overcome the fear of controversy and gain support for sexuality education by them.

Parental attitude toward the effectiveness of sexuality education program cannot be over emphasized. An attitude is a person's perspective towards a specified target and way of saying and doing things, an expression of disposition towards a person, place, thing, or event (attitudinal object). Individuals can

express their opinions about something which might at different times show both positive and negative attitude towards that particular thing. To some, most especially, the parents, the concern is that, initiating youngsters/ adolescents, early into sex education, could be dangerous and most likely lead to sexual promiscuity. To behavioural scientists, the introduction of sex education at this stage is proper, it prevents errors and helps to attain sexual fulfilment. Unfortunately, in spite of the increasing sexual problems, parents and schools are still not providing adolescents with proper knowledge about sex.

At present, in Nigeria, sex education program integrated into the Junior Secondary School is gradually going into extinction. The reason being that the Physical and Health Education (PHE) subject that incorporated sex education is no longer features prominently in the schools. Compounding the problem is the parental attitude towards inclusion of sex education in the school curriculum.

Therefore, problems resulting from lack of sex education in the community include; unwanted pregnancies, increase abortion rates, high incidence of sexually transmitted diseases and high rates of sexual promiscuity. All these could be traceable to high rates of school dropouts, increase in illiteracy, lack of concentration, poor school performance, deterioration of mental health of students and psychological problems. The primary cause of these lamentable circumstances is simply because the youngsters are often filled with shame and guilt about sex and how to talk about it with their parents. In addition, a growing proportion of these youths are not only sexually active from an early age, but they also engage in multiple sexual partners for lack of information and education. Against this backdrop therefore, this work assessed parental attitude towards the introduction of sex education in junior secondary school curriculum in Oyo State.

Research Questions and Hypotheses

This study provided answers to the following research questions:

1. Do the parents have positive attitude

towards introduction of a set of lessons on sexuality education in junior secondary schools?

2. To what extent, will parental attitudes toward sexuality education, influence their willingness to allow the introduction of sex education as a subject in the junior secondary school curriculum?

Hypotheses

H₀₁: There is no significant difference between the Age grade and Parental Attitude towards Inclusion of Sexuality Education in the Junior Secondary School Curriculum.

H₀₂: There is no significant difference between Gender of the Parents and their Attitude towards Sexuality Education.

H₀₃: There is no significant difference between Education level of the Parents and their Attitude towards Introduction of Sexuality Education in the School Curriculum.

H₀₄: There is no significant difference between Occupations of the Parents and their Attitude towards Sexuality Education.

H₀₅: There is no significant difference between Geographical Location (Rural – Urban) of the Parents and their Attitude towards Introduction of Sexuality Education in the Junior Secondary School Curriculum.

Methodology

The study adopted Ex post facto research design. No manipulation of variable(s). The participants for the study were drawn from Oluyole Local Government Area in Oyo state. Purposive sampling technique was used to sample parents, including male and female from urban and rural area of the study.

A self-constructed questionnaire titled 'Parental attitude towards the introduction of sex education in junior secondary school' was used to collect data on the study. The questionnaire consisted of three sections. Section A comprised of demographic data, Section B consisted 24 items used to elicit information on Parent's knowledge on sex education. Section C consisted of a set of topics to be taught in schools with a four (4) point modified Likert scale. The reliability coefficient estimated using Cronbach Alpha method was $r = .76$. The responses were collated and analyzed using descriptive statistics, T-test and ANOVA.

Results and Discussion

Research Question 1: Do the Parents approve introduction of a set of lessons on sexuality education in Junior Secondary School?

Table 1: Parent's approval on Introduction of a set Lessons on Sexuality Education in Junior Secondary School

S/N	Statement	SA	A	D	SD	$\bar{x}$	S.D
1.	Teaching of male and female reproductive parts and their function	104(52)	88(44)	3(1.5)	5(2.5)	3.46	0.656
2.	Sexually transmitted diseases	91(45.5)	85(42.5)	5(2.5)	19(9.5)	3.24	0.898
3.	Values of sexual abstinence until marriage	58(29.0)	117(58.5)	24(12.0)	1(0.5)	3.16	0.638
4.	Physical and social developmental changes associated with puberty and adolescence	110(55.0)	77(38.5)	12(6.0)	1(0.5)	3.48	0.634
5.	Positive communication with family	53(26.5)	130(65.0)	14(7.0)	3(1.5)	3.17	0.608
6.	Positive friendship	58(29.0)	120(60.0)	19(9.5)	3(1.5)	3.17	0.648
7.	Healthy intimate relationship	65(32.5)	116(58.0)	13(6.5)	6(3.0)	3.20	0.687
8.	The use of contraceptives	40(20.0)	58(29.0)	38(19.0)	64(32.0)	2.37	1.131
9.	Teenage pregnancy	48(24.0)	108(54.0)	38(19.0)	6(3.0)	2.99	0.743
10.	Reproduction and childbirth	73(36.5)	109(54.5)	14(7.0)	4(2.0)	3.26	0.672
11.	Pre-marital sex	41(20.5)	118(59.0)	29(14.5)	12(6.0)	2.94	0.768
12.	Family/individual value and moral beliefs on sexuality	60(30.0)	109(54.5)	27(13.5)	4(2.0)	3.13	0.708
13.	Rape	25(12.5)	48(24.0)	100(50.)	27(13.5)	2.36	0.868

14.	Alternative abortion	41(20.5)	29(14.5)	46(23.0)	84(42.0)	2.14	1.172
15.	Sexual abuse of children	67(33.5)	65(32.5)	18(9.0)	50(25.0)	2.75	1.169
16.	Prostitution	25(12.5)	45(22.5)	62(31.0)	68(34.0)	2.14	1.026
17.	Sexual decision making	49(24.5)	47(23.5)	45(22.5)	59(29.5)	2.43	1.154
18.	Parenting responsibilities	67(33.5)	105(52.5)	16(8.0)	12(6.0)	3.14	0.800
19.	Religious view on sexuality	85(42.5)	94(47.0)	16(8.0)	5(2.5)	3.30	0.722
20.	Divorce	24(14.0)	88(44.0)	60(30.0)	24(12.0)	2.60	0.874

Weighted Average mean=2.92

Source: Field Survey 2015

Findings

The table above revealed that, the summary result of the total of parents approve of introduction of set of lessons on sexuality education in Junior Secondary School was 2.92 indicating a percentage of 65. Furthermore, the 'decision rule' says that the meaning of the scale used is 2.92. Hence, any score above 2.92 shows that parents "Strongly agree" to the approval of introduction of a set of lessons on sexuality education in junior Secondary School.

However, any score below 2.92 indicates to a low extent, parents' approval of a set of lessons on sexuality education in Junior Secondary School Curriculum. Therefore, the score above showed that to greater percentage, parents approve the introduction set of lessons on sexuality education in Junior Secondary School Curriculum.

Research Question 2: To what extent will Parental Attitudes toward Sexuality Education influence their Willingness to allow the Introduction of Sex Education as a Subject in the Junior Secondary School Curriculum?

Table 2: Parent's attitude on their willingness to allow the introduction of sex education as a subject in the Junior Secondary School Curriculum.

S/N	Statement	SA	A	D	SD	$\bar{x}$	S.D
1.	Sexuality education should be given enough emphasis in schools curriculum	98(49.0)	95(47.5)	5(2.5)	2(1.0)	3.45	0.599
2.	Sexuality education is an important aspect of youngsters' life	65(32.5)	125(62.5)	9(4.5)	1(0.5)	3.27	0.565
3.	Sexuality education teaching is a waste of time in school	20(10.0)	76(38.0)	53(26.5)	51(25.5)	2.33	0.966
4.	Information about sex and its associate can make the youngster to be more promiscuous	45(22.5)	114(57.0)	32(16.0)	9(4.5)	2.98	0.753

5.	Parents should be involved in sexuality education for their children	83(41.5)	106(53.0)	5(2.5)	6(3.0)	3.33	0.673
6.	Sexuality education informed youngsters to make decisions about sexual behavior	64(32.0)	123(61.5)	11(5.5)	2(1.0)	3.25	0.597
7.	HIV/AIDS is a serious issue in our society	123(61.5)	73(36.5)	4(2.0)	-	3.60	0.531
8.	Sexuality education should be discussed with youngsters so that they will not have problems relating to sex in future	95(47.5)	95(47.5)	7(3.5)	3(1.5)	3.41	0.636
9.	Sexuality information can reduce the rate of premature deaths among the youngsters	86(43.0)	113(56.5)	13(6.5)	6(3.0)	3.31	0.724
10.	The school should be an educational environment for youngsters to learn more about sexuality education	73(36.5)	113(56.5)	9(4.5)	5(2.5)	3.27	0.663
11.	Sexuality education should be taught in school	88(44.0)	104(52.0)	6(3.0)	2(1.0)	3.40	0.577
12.	Students should be taught on how to deal with sexual abuse	85(42.5)	110(55.0)	4(2.0)	1(0.5)	3.40	0.557
13.	Sex education will create curiosity among school children	33(16.5)	110(55.0)	30(15.0)	27(13.5)	2.75	0.891
14.	Students may want to practise what they learnt about intimate relationship	29(14.5)	113(56.5)	30(15.0)	28(14.0)	2.72	0.882
15.	It is too early to teach JSS students on sex education	21(10.5)	27(13.5)	84(42.0)	68(34.0)	2.01	0.948
16.	Topic on pregnancy should be taught in schools	58(29.0)	120(60.0)	15(7.5)	7(3.5)	3.14	0.696
17.	Parents should teach their children/ward sex education	75(37.5)	118(59.0)	7(3.5)	-	3.34	0.544

18.	Teachers are in the best position to teach the students sex education	77(38.5)	91(45.5)	28(14.0)	4(2.0)	3.21	0.752
19.	Students should be taught religious view about sex education	110(55.0)	73(36.5)	13(6.5)	4(2.0)	3.45	0.707
20.	Total abstinence should be taught in school	85(42.5)	83(41.5)	29(14.5)	3(1.5)	3.25	0.755
21.	The use of contraceptive should be taught during sex education	22(11.0)	85(42.5)	77(38.5)	16(8.0)	2.57	0.793
22.	Our cultural values should be given preference when teaching sex education	65(32.5)	104(52.0)	26(13.0)	5(2.5)	3.15	0.733
23.	The images and materials used in teaching sex education may corrupt the students	32(16.0)	109(54.5)	37(18.5)	22(11.0)	2.76	0.854
24.	The government should make the teaching of sex education mandatory in all schools(primary,	77(38.5)	95(47.5)	13(6.5)	15(7.5)	3.17	0.851

Source Field survey 2015

Weighted mean=3.49

Findings

The table above revealed the attitude of parents towards sexuality education, their influences and their willingness to allow the introduction of sex education as a subject in Junior Secondary School Curriculum. From the table, it is observed that 75% of the parents show their willingness to sex education with weighted mean of 3.49. 25% showed that they do not agree with the introduction of sex education in

the Junior Secondary School Curriculum. Since the larger percentages of the parents showed their willingness to sex education, then it can be concluded that to a greater extent parental attitude to sexuality education influence their willingness to introduction of sex education into Junior Secondary School Curriculum.

Research Hypothesis

H₀: There is no significance difference between the age grade and Parental Attitude towards Inclusion of Sexuality Education in the Junior Secondary School Curriculum.

Table 3: Attitude through Age Grade

AGE	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
20-30yrs	60	74.72	6.418	.829	73.06	76.37	55	86
31-40yrs	85	74.29	5.584	.606	73.09	75.50	55	87
41yrs	55	73.76	5.453	.735	72.29	75.24	60	85
above	200	74.28	5.795	.410	73.47	73.08	55	87
Total								

Source: Field Survey 2015

Findings

The age difference in terms of parental attitude toward inclusion of sexuality education in the JSS curriculum was not significant, $F(2,197) = 0.387, p=0.680, p<0.05$. Age 20-30yrs ($x=74.72, SD= 6.418$), Age 31-40yrs. ($x=73.76, SD=5.453$). Age 20-30, 31-40 and 41 years above of parents age did not differ on their 'attitude towards inclusion of sexuality education in the

Junior Secondary School Curriculum. Since the critical value of the F-ratio is not significant, it follows that there is no difference in terms of parental attitude towards sexuality education in the Junior Secondary School Curriculum by their age.

H_{02} : There is no significant difference between Gender of the Parents and their Attitude towards Sexuality Education.

Table 4: The table shows the t-value of Pearson's r and significant (p) value of each group of the variable respectively.

Gender	N	Mean	Std. Deviation	Df	T	Sig	R
Male	92	75.30	5.664	198	2.349	.407	0.3867
Female	108	73.40	5.786				

Source: Field Survey 2015

Findings

The table above shows that no significant difference was found between male and female in terms of their attitude towards sexuality education, $t(198) = 2.349, p=0.407$ with male ($x=73.40, S.D=5.786$) and effect size of ($r = 0.3867$) is very small. Hence, there is no

significant difference between male and female parents' attitude towards sexuality education in Junior Secondary School Curriculum.

H_{03} : There is no significant difference between Education level and their Attitude towards Introduction of Sexuality Education in School Curriculum.

Table 5: Attitude to Sex Education Teaching

Educational Qualification	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No Formal	15	73.60	5.475	1.414	70.57	76.63	61	86
Primary	29	73.76	4.642	.862	71.99	75.52	65	85
Secondary	70	73.16	6.643	.794	71.57	75.74	55	86
Higher education	86	75.48	5.300	.571	74.34	74.34	63	87
Total	200	74.28	5.795	.410	73.47	75.08	55	87

Source: Field Survey 2015

Attitude to Sex Education

Groups	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	146.024	3	48.675	1.460	.227
Within Groups	6535.851	196	33.346		
Total	6681.875	199			

Source: Field Survey 2015

Findings

The results from the table above indicates that no difference was found between parents attitude towards sexuality education in terms of their occupation, $F(3, 196) = 1.460, p=0.227. p<0.05$. Hence, it can be concluded that parents in different occupation did not differ in their

attitude towards sexuality education.

H_{04} : There is no significant difference in geographical location (Rural-Urban) and their Attitude towards Introduction of Sexuality Education in the Junior Secondary School Curriculum

Table 6: The table shows the t-value, the value of Pearson's r and significant (p) value of each group of the variable respectively.

Location	N	Mean	Std. Deviation	Df	T	Sig	R
Urban	110	75.12	5.734	198	2.299	.759	
Rural	90	73.24	5.732				

Source: Field Survey 2015

Findings

The table above revealed that no difference was found with parents' attitude towards introduction of sexuality education in Junior Secondary School curriculum and their geographical location, Urban (M= 75.12, SD=5.734) and Rural (M= 73.24, Sd=5.732), $t(198)-2.299, p=0.759$. The implication is that there was no significant mean difference in the parent's attitude towards introduction of sexuality education scores between the parents in urban location and parents in rural locations.

Discussion

This study revealed that 95% of parents supported teaching of sexuality education in schools. Similarly, 96.5% of parents indicated that sex education should be emphasised and included in the schools' curriculum. More importantly, 86.5% of them supported that government should make the of sex education mandatory in all schools (pry, secondary & tertiary) curriculum This finding corroborates Eleanor Harding's stand in 2017 that sex education must be included the school curriculum in U.K. She stressed that many of these teenagers are living with STIs due to poor or lack of sex education in schools. Also, more than average (52%) respondents were of the view that sex education is not a waste of time. In addition, 94.5% agreed that parents should be involved in sexuality education for their children. Little wonder, Welshimer and Harris (1994) emphasized that educators should

research more on the attitudes and values of parents on the issues of sex education in order to overcome controversies surrounding the implementation. In actual fact, from this finding, 84.5% of the parents advocated for cultural values to be given preference when teaching sex education in schools. Surprisingly, 53.5% of the parents agreed that contraceptives should be taught during sex education, 76% also agreed that it is not too early to teach junior/middle school students on sex education. This finding is in line with Kelly 2018, who stressed that abstinence education should not be relied on because it denies reality about human sexuality development. Besides, adolescence is characterised with hormonal stage filled with erotic feelings, desires, and sexual curiosity. One can deduce from the findings of this study that few parents are apprehensive that sex education teaching in schools can lead to undue curiosity and that these youngsters might want to experiment with it.

Summary, Conclusion and Recommendation

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

Parents approved introduction of a set of lessons on sexuality education in Junior Secondary School.

Parents showed their willingness to allow the introduction of sex education as a subject in Junior Secondary Schools.

In conclusion, previous research shows that major lack of knowledge is still prevalent in

terms of sexual health terminologies, sexual behaviors, and safe sex among youngsters, and they are also concerned with the avoidance of pregnancy, rather than reducing the risk of STDs. Therefore, sexuality education should be incorporated as a separate subject besides biology (or any other subject), and implemented in the Junior Secondary Schools. Contrary to popular belief, research asserts that sex and HIV education neither fosters early sexual practice nor increases sexual activity, but rather reduces the number of sexual partners and the frequency of sex, while promoting safe sex and responsible sexual behavior. The current exploratory study makes important contributions by accumulating useful information pertaining to an unexplored area of knowledge in Oluyole Local Government. This study provides empirical findings which can be used to generate quite a good number of questions for future research in the field of sexuality education of the youngsters.

Recommendations

It is therefore recommended that:

1. Parents should be fully informed and be involved in any information related to sex in the school system;
2. Teachers involved in sexuality education in Junior Secondary Schools are encouraged to be adequately informed before teaching;
3. Sexual and reproductive health should be taught early in schools to avoid sexual related problems in future, therefore, it should be included in the school curriculum;
4. The cultural values, norms and beliefs should be incorporated into the teaching;
5. Total abstinence alone should not only be taught in school but comprehensive sexuality education included in the curriculum;
6. Images and materials should be used appropriately by the teacher taking such topics as illustrating human bodies and reproductive physiology in a way that does not comprise crude or personalized images or induced pre-marital sex;
7. Materials like radios, photographs, film stipes, slides, audio-tapes, and so on should be introduced in the learning of sexuality education to the youngsters so as to help students' learning interesting and make learning more permanent. Thus, stimulating self-activity in the students;
8. Workshops, lectures, conferences and seminars should be given to teacher in order to be able to impact the topics to the youngsters in an effective way.

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