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INSTRUCTIONS TO AUTHORS

The Journal of Education (JOE) publishes empirical and theoretical papers presented at the Annual Conference of the Association of Educational Researchers and Evaluators of Nigeria (ASSEREN) which discuss conceptual, theoretical and methodological issues as well as original empirical works in education that are related to the Conference theme. The goal of the Journal is to bring together researchers, practitioners and stakeholders in education to focus on research and methods in education and establish collaboration in these areas. To develop a high quality manuscript, authors are advised to adhere to the following suggestions of the American Psychological Association (APA) Publication Manual (6th Edition, 2010).

For empirical papers, the main headings should consist of abstract, introduction and literature review, method, results, discussion, recommendations, conclusion and references; while theoretical papers should have an abstract, introduction, theoretical or conceptual framework and position, recommendations, conclusion and references.

Manuscripts should be typed double spacing and should not be more than 15 pages in Microsoft word, 12pts font size and Times New Roman, with adequate margins on A4 paper. An abstract of between 200 and 250 words with a maximum of eight keywords is required. Presentation of tables and figures should be in line with APA format and style.

Empirical Papers

Abstract. The abstract for an empirical paper should provide a comprehensive summary of the article and should include the purpose, participants, procedures, major findings and conclusion; while the one for a theoretical paper should include the purpose, theoretical model, position and conclusion.

Introduction and Literature Review. The introduction and literature review should introduce the problem and describe previous research on the topic. There is need for relevant data for establishing existence of problem. Summary of literature review should be presented and existing gaps to be filled identified. At the end of the literature review, the purpose of the study should be stated as well as the research questions and hypotheses that will be addressed.

Method. A detailed description of methods and procedure adopted for a research study is required. Components to address here include the design, participants, instruments description, development and validation, procedure for administration of treatment in experimental study and how data are collected and analysed.

Results. Results of the study describes the outputs of data analysis. Present results in tables and figures where appropriate, according to the research questions and hypotheses that are addressed. Then interpret the findings without discussing them.

Discussion. The discussion section should relate the findings of study to earlier ones in literature in terms of similarities and differences. It should also present probable explanations to the findings as well as implications for theory and practice in the field of education.

Recommendations. The essence of recommendations is to base educational practice based on research findings. Recommendations should be directly related to the variables measured in the study. The answers to the research findings and results of test of hypotheses should guide researchers in making recommendations based on any study.

Conclusion. Conclusion should summarize the findings of the study and should be based on the purpose of the study.

Reference. All cited works in text must be referenced in alphabetical order according to APA format and style.

Theoretical Papers

For theoretical papers, the author should consider theoretical and practical applications of existing theories in Nigerian context. The researcher should ensure the feasibility of application of theoretical frameworks adopted within the cultural context and practical constraints of the education system in Nigeria.

Introduction. The problem and its importance should be clearly stated.

Theoretical or Conceptual framework. The theoretical or conceptual framework should be clearly explained and how it relates to the problem or topic.

Position. The author needs to describe his/her position on how a particular problem in education can be solved based on the theoretical or conceptual framework.

Recommendations. All recommendations should be based on the theoretical or conceptual framework or a new model developed by the researcher.

Conclusion. The findings of the paper should be summarized and presented as they relate to the modified or new model developed.

EDITORIAL

The Association of Educational Researchers and Evaluators of Nigeria (ASSEREN) presents to its members and non-members alike volume 6 of the ASSEREN Journal of Education (AJOE). Included in the volume are well researched articles presented at the 22nd Annual National Conference of the Association which was held from **July 27th to 30th July 2020**. A spectacular feature of the conference of 2020 was that it was held online as a result of the Covid-19 pandemic. The Theme of the Conference was: **“Research and Evaluation Dynamics for Functional Education”**.

The ASSEREN Journal of Education is a peer-reviewed Journal for publication of Original Theoretical and Empirical papers that are presented during the annual conference of the association. This special edition that derived from an online conference will provide the needed insights into professional issues and ethics in teaching and learning, and enhance quality education and assessment in Nigeria through research. The editorial board acknowledged the efforts of our editors, contributors, the executives of the Association and all others that have in one way or the other contributed immensely towards the actualization of the production of this Sixth Edition of the Journal. Special thanks to the consulting Editors who are distinguished senior citizens and also members of the association.

**AN ANALYSIS OF SYNTACTIC VARIATION IN NIGERIAN ENGLISH
AMONG SECONDARY AND UNIVERSITY STUDENTS IN SOUTHWESTERN
NIGERIA**

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Abstract

The study determined the extent to which sociolinguistic factors of gender and level of education can affect syntactic variation in Nigerian English using polytomous and dichotomous test items. The study adopted the survey design with a two-tier population of secondary school and undergraduate students in Southwestern Nigeria. Sample comprised 1,080 students who were drawn from nine secondary schools and three universities in three states in Southwestern Nigeria. The total number of the secondary school participants and undergraduate participants was 540 each. The data used for the study were gathered through the use of a 40-item questionnaire, consisting of 20 polytomous and 20 dichotomous multiple-choice Test (MCT) items on English Language. The collected data were subjected to Differential Item Functioning (DIF) analysis using X-Calibre 4.2 (software for test item analysis). The results of the study revealed that the two variables of Gender and Levels of Education actually accounted for syntactic variation in both MCT formats; but gender did not have as strong influence on syntactic variation as does levels of education. When polytomous items were examined, seven (35%) out of the 20 polytomous items exhibited DIF while only five of the items exhibited DIF based on level of education. Nine (45%) items, out of the twenty dichotomous test items exhibited DIF in terms of levels of education while the remaining 11 (55%) did not display any variation. When gender was

made a point of DIF analysis in the dichotomous item types, the influence of gender on syntactic variation was seen in only two items, which accounted for 10% of the syntactic variation in the test responses. This debunked the general views and submissions of scholars that women's speech tends towards the standard variety of English more than men. The study concluded that while there may be some other socio-linguistic factors that account more strongly for variation in the standard of English spoken by the participants in this study other than gender and level of education multiple-choice test items formed a good instrument for examining linguistic variation generally.

Key words: Differential Item Functioning, Test Item Parameters, Syntactic Variation, Nigerian English

Introduction

Investigating syntactic variations from a sociolinguistic angle is very important because it enables us to appreciate the nexus between grammatical structures and social variables such as level of education, gender and ethnicity; a sociolinguistic investigation into linguistic variation encompasses linguistic variables and social variables. A linguistic variable, according to Tagliamonte (2016, p.1) while citing Labov (1969), is two or more ways of saying the same thing (see also Tagliamonte, 2006, p.10); social variables deal with the social organisation of the society into different classes based on age, gender, level of education, ethnicity and so on. Tagliamonte (2006) observes that

linguistic variation also encompasses an entire continuum of choices ranging from the choice between English or French, for example, to the choice between different constructions, different morphological affixes, right down to the minute microlinguistic level where there are subtle differences in the pronunciation of individual vowels and consonants (p.6).

Wardhaugh (2006) explains that sociolinguistics is concerned with investigating the relationships between language and society with the goal being a better understanding of the structure of language and of how language functions in communication. Coulmas (1998) describes sociolinguistics as a branch of linguistics which is concerned with describing language use as a social phenomenon. Furthermore, Coulmas categorises minor social factors such as class, sex and age under micro-sociolinguistics which examines how social structures influence the way people talk and how language varieties and patterns of use show these social attributes, while attitude towards languages in the society and the assignment of roles to the language are social factors considered under macro-sociolinguistics.

On the other hand, syntactic variations are those alternative choices that people make as regards the structures of their sentences and linguistic elements that are used. Spruit (2008) posits that syntactic variation studies the ways in which linguistic elements are put together to form constituents. As claimed by Schluter (2005, p.15) that it is wrong

to conclude that we will ever manage to cast a grammar into a stable and orderly set of rules (see also Guy, 2011a, p.178) and by Bhatt (2001, p.528) that – as a result of the spread of the English language across the globe and its contact with other indigenous languages of the areas that it reaches – English has become a language that has multiple norms of use, variation is inevitable (McMahon & Maguire, 2011, p.1) because these non-native users of English have their different mother tongues, have acquired different levels of education, belong to different genders and ethnic groups. These social variables are capable of interfering in how they will use the language.

Guy (2011b, p.159) claims that people will differ from one another in the way they speak. It is further argued that some of the differences found in the speech of different people are idiosyncrasies of individual speakers which can be accounted for in what Tagliamonte (2009, p.76) observes in language when she states that speakers do make certain choices when they speak and this often leads to linguistic variability. Kallen (1991, p.67) also reports that characteristics of speakers such as age, sex, social class, social network and mobility may have an effect on socially marked linguistic phenomena just as Guy (2011, p.179) also remarks that no two speakers can have the same grammars and linguistic repertoires as no single speaker can have a completely homogenous and invariant grammar. While it is possible for a single user of a language to observe variations in their language use in such a way that the usage of such an individual cannot be cast into a pre-observed structure, different people do not use language in the same way as they do not even observe the same structural patterns; variations that are found in language depend on and are motivated by social factors or variables such as age, gender, ethnicity, level of education.

Bamgbose (1995) identifies three varieties of Nigerian English based on who uses it; these varieties are Contact English, Victorian English and School English where Contact English can be linked to Nigerian Pidgin English and Broken English, Victorian English is linked to the variety that is spoken by the elites while School English is that variety that is used as a medium of instruction and which has been simplified so as to make it available to the majority of Nigerians. To him, these three strands combine together to form the whole, *Nigerian English*, as it is now. This current form and status of English in Nigeria has been linked by scholar to the contact that the English language had with the indigenous languages in Nigeria's sociocultural and political situation. This contact generated another variety of English which is now called *Nigerian English*.

In Nigeria, English has penetrated every sphere of our existence ranging from educational, political, cultural, sociolinguistic to linguistic (Bamgbose, 1995). Although English has an official status in Nigeria, the language cannot be termed a national language. Following the description of a national language and a lingua franca by Akindele and Adegbite (2005, p.51-52) that a national language must cut across the entire strata of the society in its use and application; this is not the case with English in Nigeria as more than a half of the entire populace in the country do not have access to it. However, Tunde-Awe (2014) asserts that if the English language has to be an effective means of communication in Africa it must be ready to welcome alteration so that it will be able to explain African concepts. This assertion corroborates the view of Achebe (1975) who declares:

I feel the English language will be able to carry the weight of my African experience. But it will have to be a new English, still in communion with its ancestral home but altered to suit its new African surroundings (p. 103).

Britain (2010) reports the instances of grammatical variation in the contemporary spoken English of England and identifies – and many more – ungrammatical omission, ungrammatical addition of grammatical elements, wrong use of past participle forms of verbs as recognized by Akande and Okanlawon (2011), Taiwo (2012) and Akande (2013) in Nigerian English. Roberts (2014) also discusses doubling of subject as one of the features of grammatical variation in Martinique French. These researchers conclude that these features they observe are features of non-standard varieties of the languages they observe. The researchers then conclude that double modal constructions are sensitive to socio-economic factors like age, level of education and gender. Cheshire (2003) also claims that syntactic variation is a means by which people create or reveal their identities and, therefore, concludes that there are connections between syntactic variation and social dimensions of gender and social class.

Although there have been a lot of studies on the grammar of Nigerian English, most of these studies have focused on the description of the grammar of Nigerian English by setting a comparative paradigm with any of the global standard varieties of English (Igboanusi, 2006; Akande & Okanlawon, 2011; Taiwo, 2012; Ohakamike, 2016). It seems that existing works on Nigerian English has paid little attention to grammaticality judgement in relation to the influence of social variables such as age, level of education and gender on syntactic variation. Those that have investigated this phenomenon have not paid attention to variation within the standard variety of English in Nigeria (Jibril, 1991; Jowitt, 1991). It is also different from those studies that have been carried out on syntactic variation from the perspective of sociolinguistics because it situates variation in Nigerian English not only in a Labovian variationist approach but also in Kroch's *Multiple Grammars* in which these multiple grammars either compete for acceptance or use.

Differential Item Functioning is the procedure which test experts employ to investigate the effect of group difference in the group to which each candidate belongs on overall test performance. Claims that tests are biased against certain minority groups have led to numerous lawsuits or bans on certain types of tests (Hambleton, Swaminathan, & Rogers, 1991). Therefore, given the serious consequences of DIF for test-takers, test-users and test-developers, the identification and use of procedures that can effectively detect DIF is very important (Lopez, 2012).

The aim of the study was to examine how sociolinguistic factors affect syntactic variation in Nigerian English. The specific objectives of the study were to:

- i. examine the extent to which gender can account for syntactic variation in Nigerian English; and
- ii. discuss the influence of levels of education on syntactic variation in Nigerian English.

Based on the above-stated objectives, the following research questions were addressed:

- a. Can gender influence syntactic variation significantly?
- b. Is there any connection between syntactic variation and the levels of education of the individual users or speakers of Nigerian English?

Methodology

The study employed the survey design, with a two-tier population of secondary school and undergraduate students in Southwestern Nigeria. Sample comprised 1080 students who were drawn from nine secondary schools and three universities in three states in South-western Nigeria. The total number of the secondary school participants and undergraduate participants was 540 each. The data used for the study were gathered through the use of a 20 Multiple-choice Test (MCT) polytomous-item questionnaire on English Language. The validity of the multiple-choice Test (MCT) was determined through experts' judgement. The three experts that appraised the questionnaire had doctoral degree in Tests and Measurement and have been teaching in the university for more than 10 years. The 20-item questionnaire was administered on a group of 40 secondary and 40 university students who are not part of the 1080 sample selected for the main study so as to determine its reliability. The collected data from the 80 students was subjected to Split-half reliability investigation and the coefficient of reliability obtained was 0.86, which points to the fact that the questionnaire is reliable.

The completed and retrieved questionnaires (during main administration) were coded and analysed by a *Test and Measurement* expert who is also a test analyst. The collected data were subjected to *Differential Item Functioning (DIF)* analysis using *X-Calibre 4.2* (software for test item analysis). The 20 multiple-choice sentences were subjected to *Differential Item Functioning (DIF)* investigation so as to establish how the social variables of gender and level of education can influence syntactic constructions and choices. The results of the analysis were then discussed extensively from a linguistic perspective.

Results and Discussion

The 20 multiple choice test items in the research instrument were polytomous test items. This means that all the four options under each of the items were correct to an extent; however, their degree of correctness varied from one option to another. The essence of using polytomous test items was to investigate if variation actually exists within a standard variety of a language – in this case, English.

To investigate syntactic variation using polytomous multiple-choice test items, the data collected was subjected to calibration using *X-Calibre 4.2*. The twenty items were calibrated at 25 maximum loops under three-parameter model Item Response Theory specification (difficulty, discrimination and guessing) at maximum likelihood estimation. Table 4.1 revealed the classical statistics, the item parameters, and any flags for each calibrated item independent of any of the social variables under discussion. The F flag indicates that the item fit statistics (z Resid for dichotomous or chi-square for polytomous) was significant, and the item did not fit the IRT model. The La, Lb, and Lc flags indicate that the a/b/c parameters were lower than the minimum acceptable value. The "a" parameter indexes the discrimination of the item, as larger values for "a" will result in a greater slope of the IRF and indicate the item differentiates examinees well. The "b"

parameter is the item difficulty parameter and equals the location on the theta continuum where the probability of a correct response equals $0.50 + (c/2)$. It follows that multiple-choice items with more positive "b" parameters are more difficult for examinees, as a higher trait level is required to endorse the keyed response 50% of the time. The "c" parameter equals the probability of an examinee of infinitely low theta obtaining a correct response due to guessing.

Table 1: Item Parameters for All Calibrated Items (Polytomous)

Item ID	Item Mean	R	A	B	C	Flag(s)
1	1.969	0.156	0.144	0.613	8.09, -5.66, 2.38	F, La
2	3.047	0.447	0.172	0.356	-2.31, -1.97, -2.03	F, La
3	2.749	0.335	0.325	1.924	-3.30, -5.13, 3.03	F
4	3.524	0.134	0.077	-5.644	-3.30, -5.13, 3.03	F, La, Lb
5	2.814	0.242	0.035	-5.644	8.09, -5.66, 2.38	F, La, Lb
6	3.114	0.406	0.167	0.073	-2.31, -1.97, -2.03	F, La
7	3.213	0.168	0.058	-4.968	-2.31, -1.97, -2.03	F, La, Lb
8	3.273	0.239	0.288	-1.431	-2.10, -2.59, 2.12	F, La
9	3.280	0.523	0.309	0.442	-2.31, -1.97, -2.03	F
10	3.099	0.416	0.195	0.382	-2.31, -1.97, -2.03	F, La
11	2.104	0.100	0.068	0.754	13.41, -12.92, 11.12	F, La
12	2.805	0.287	0.035	-3.953	-2.10, -2.59, 2.12	F, La, Lb
13	3.466	0.435	0.260	-0.403	-2.31, -1.97, -2.03	F, La
14	3.544	0.561	0.388	-0.041	-2.31, -1.97, -2.03	F
15	3.340	0.701	0.649	0.859	-2.31, -1.97, -2.03	F
16	3.186	0.320	0.155	-1.080	-1.83, 0.48, -2.53	F, La
17	2.967	0.358	0.096	-1.645	-2.10, -2.59, 2.12	F, La
18	3.553	0.531	0.437	0.087	-2.31, -1.97, -2.03	F
19	3.175	0.196	0.117	-1.854	-3.30, -5.13, 3.03	F, La
20	3.166	0.244	0.240	-0.644	-3.30, -5.13, 3.03	F, La

All the calibrated items were positively worded because most of the items were positive in the propositions put forward and uniformity in the coding of the items as a result of the polytomous nature of the items in which either disagreement or disagreement to the proposition are considered grammatically correct as a result of grammatical well-formedness; as such, the control data file was filled positively. The scoring was forced to represent polytomous order from 1 to 4 which was the weight allocated to the options based on their degree of correctness. Participants were to identify the most appropriate out the four (*A* to *D*) provided. For the most appropriate option, the weight of 4 was given, 3 was allocated to the more appropriate option, followed by the weight of 2 which was given to the marginally appropriate option and the weight of 1 for the least appropriate option. The results revealed that the pattern displayed failed to comply with the existing rules for the polytomous analysis and, thus, could not reveal any variation. However, these polytomous items were subjected to analysis by comparing them with each of the social variables one after the other. By doing this, the items were subjected to analysis for each of the social variables – *Gender and Levels of Education*.

Research Question 1: Can gender influence syntactic variation significantly?

The items were filtered, divided into two categories – *male* and *female* – and subjected to analysis by using X-Calibre 4.2. The male respondents were 560 accounting for 51.9% of the total 1,080 respondents while the female respondents were 520 accounting for 48.1% of the respondents. The results from the two analyses were compared so as to investigate variation in the items as a result of gender. The compared result is presented in Table 2 below.

Table 2: Results of the Polytomous Test Items for Gender

Item ID	Options by Ranking	Male (%: $\frac{x}{560} \times 100$)	Female (%: $\frac{x}{520} \times 100$)	Total (%: $\frac{x}{1080} \times 100$)
1	C	112 (20%)	65 (12.5%)	177 (16.4%)
	B	134 (23.9%)	108 (20.8%)	242 (22.4%)
	D	17 (3%)	15 (2.9%)	32 (3%)
	A	297 (53%)	332 (63.8%)	629 (58.2%)
2	D	164 (29.3%)	163 (31.3%)	327 (30.3%)
	C	309 (55.2%)	271 (52.1%)	580 (53.7%)
	B	37 (6.6%)	33 (6.3%)	70 (6.5%)
	A	50 (9%)	53 (10.2%)	103 (9.5%)
3	D	27 (4.8%)	23 (4.4%)	50 (4.6%)
	A	401 (71.6%)	388 (74.6%)	789 (73.1%)
	B	86 (15.4%)	75 (14.4%)	161 (14.9%)
	C	46 (8.2%)	34 (6.5%)	80 (7.4%)
4	A	329 (58.8%)	350 (67.3%)	679 (62.9%)
	C	178 (31.8%)	139 (26.7%)	317 (29.4%)
	B	37 (6.6%)	18 (3.5%)	55 (5.1%)
	D	16 (4.9%)	13 (2.5%)	29 (2.7%)

5	C	132 (23.6%)	144 (27.7%)	276 (25.6%)
	D	226 (40.4%)	180 (34.6%)	406 (37.6%)
	A	161 (28.8%)	158 (30.4%)	319 (29.5%)
	B	41 (7.3%)	38 (7.3%)	79 (7.3%)
6	B	220 (39.3%)	197 (37.9%)	417 (38.6%)
	C	218 (38.9%)	219 (42.1%)	437 (40.5%)
	A	88 (15.7%)	70 (13.5)	158 (14.6%)
	D	34 (6.1%)	34 (6.5%)	68 (6.3%)
7	B	263 (47%)	232 (44.6%)	495 (45.8%)
	A	178 (31.8%)	187 (36%)	365 (33.8%)
	C	93 (16.6%)	82 (15.8%)	175 (16.2%)
	D	26 (4.6%)	19 (3.7%)	45 (4.2%)
8	B	232 (41.4%)	172 (33.1%)	404 (37.4%)
	C	283 (50.5%)	315 (60.6%)	598 (55.4%)
	A	29 (5.2%)	18 (3.5%)	47 (4.4%)
	D	16 (2.9%)	15 (2.9%)	31 (2.9%)
9	D	330 (59%)	305 (58.7%)	635 (58.8%)
	C	106 (18.9%)	112 (21.5%)	218 (20.2%)
	B	70 (12.5%)	51 (9.8%)	121 (11.2%)
	A	54 (9.6%)	52 (10%)	106 (9.8%)
10	A	265 (47.3%)	232 (44.6%)	497 (46%)
	C	127 (22.7%)	121 (23.3%)	248 (23%)
	B	140 (25%)	140 (26.9)	280 (25.9%)
	D	28 (5%)	27 (5.2%)	55 (5.1%)
11	D	49 (8.8%)	53 (10.2%)	102 (9.4%)
	A	229 (40.9%)	168 (32.3%)	397 (36.8%)
	B	57 (10.2%)	35 (6.7%)	92 (8.5%)
	C	225 (40.2%)	264 (50.8%)	489 (45.3%)
12	D	237 (42.3%)	231 (44.4%)	468 (43.3%)
	C	70 (12.5%)	55 (10.6%)	125 (11.6%)
	A	151 (27%)	144 (27.7%)	295 (27.3%)
	B	102 (18.2%)	90 (17.3%)	192 (17.8%)
13	C	368 (65.7%)	319 (61.3%)	687 (63.6%)
	B	120 (21.4%)	113 (21.7%)	233 (21.6%)
	A	61 (10.9%)	75 (14.4%)	136 (12.6%)
	D	11 (2%)	13 (2.5%)	24 (2.2%)
14	C	374 (66.8%)	372 (71.5%)	746 (69.1%)
	A	111 (19.8%)	77 (14.8%)	188 (17.4%)
	B	70 (12.5%)	63 (12.1%)	133 (12.3%)
	D	5 (0.9%)	8 (1.5%)	13 (1.2)
15	A	390 (69.6%)	375 (72.1%)	765 (70.8%)
	D	41 (7.3%)	39 (7.5%)	80 (7.4%)
	B	40 (7.1%)	32 (6.2%)	72 (6.7%)
	C	89 (16%)	74 (14.2%)	163 (15.1%)

16	C	305 (54.5%)	279 (53.6%)	584 (54.1%)
	D	101 (18%)	110 (21.2%)	211 (19.5%)
	B	102 (18.2%)	85 (16.3%)	187 (17.3%)
	A	52 (9.3%)	46 (8.8%)	98 (9.1%)
17	A	209 (37.3%)	213 (41%)	422 (39.1%)
	D	149 (26.6%)	130 (25%)	279 (25.8%)
	B	158 (28.2%)	142 (27.3%)	300 (27.8%)
	C	44 (7.9%)	35 (6.7%)	79 (7.3%)
18	B	418 (74.6%)	392 (75.4%)	810 (75%)
	A	55 (9.8%)	65 (12.5%)	120 (11.1%)
	D	47 (8.4%)	40 (7.7%)	87 (8.1%)
	C	40 (7.1%)	23 (4.4%)	63 (5.8%)
19	C	207 (37%)	213 (41%)	420 (38.9%)
	D	262 (46.8%)	240 (46.2%)	502 (46.5%)
	A	43 (7.7%)	40 (7.7%)	83 (7.7%)
	B	47 (8.4%)	27 (5.2%)	74 (6.9%)
	Missing	1 (0.2%)	0 (0%)	1 (0.1%)
20	A	136 (24.3%)	152 (29.2%)	288 (26.7%)
	B	367 (65.5%)	336 (64.6%)	703 (65.1%)
	C	45 (8%)	22 (4.2%)	67 (6.2%)
	D	11 (2%)	10 (2%)	21 (1.9%)
	Missing	1 (0.2%)	0 (0%)	1 (0.1%)

Table 2 above presents how the twenty polytomous multiple-choice test items displayed variation as reflected by the percentages of the endorsement that each of the options got as being the appropriate option which is grammatically correct. Since these items were polytomous, the options that followed each of the items could be endorsed as being correct; however, their correctness is of varying degree. A deviationist approach from a global standard variety, British English, or the canonical form was adopted to set their degrees of correctness.

From the table, the most appropriate options exhibited an elicitation range of 4.6% (Item 3) to 75% (Item 18), the instances of the options that were more appropriate ranged from 7.4% (Item 15) to 73.1% (Item 3), options that were next in line in correctness ranged from 3% (Item 1) to 29.5% (Item 5) in elicitation while the instances of the options that were least correct ranged from 1.2% (Item 14) to 58.2% (Item 1). The percentage of missing options was 0.1% (i.e., those that were not answered by respondents). What this indicates is that not all the twenty test items exhibited the same level of variation among the options that followed each of the items.

Overwhelming and strong competition was observed among some options that followed some of the items. For instance, this strong competition for grammaticality acceptance was observed between the most appropriate options and the more appropriate options for items 1, 2, 5, 6, 7, 8, 10, 17 and 19 as the most appropriate options for the items had 177 (16.4%), 327 (30.3%), 276 (25.6%), 417 (38.6%), 495 (45.8%), 404 (37.4%), 497

(46%), 422 (39.1%) and 420 (38.9%) instances while the more appropriate options had 242 (22.4%), 580 (53.7%), 406 (37.6%), 437 (40.5%), 365 (33.8%), 598 (55.4%), 248 (23%), 279 (25.8%) and 502 (46.5%) instances respectively (check Table 4.3 above). In these items, there were some of the items that the most appropriate options got endorsed as the most appropriate options more than the more appropriate options got endorsed. This was exemplified in items 7, 10 and 17 while the more appropriate options were adjudged as the options that were grammatically correct more than the most appropriate options were adjudged in items 1, 2, 5, 6, 8 and 19.

Table 2 does not only present the general competition that existed among the options for each of the items but also reveals how gender has contributed to this variationist study in passing grammaticality judgement on the correctness of the options. It can be seen from the table that the percentage of the most appropriate responses from male respondents ranged from 47.2% (Item 20) to 54% (Item 3) while that of female respondents ranged from 42.6% (Item 8) to 52.8% (Item 20). This was achieved when the numbers of instances of each of the options from each of the genders were calculated using their frequencies from each of the genders to get the percentages of the instances of each of the options accounted for by each of the genders. For example, 112 instances of the 177 instances of the most appropriate option for item 1 were accounted for by the male respondents which means that 20% of the male respondents chose the most appropriate option while the remaining 65 instances of the most appropriate option for the item was accounted for by the female respondents; this means that only 12.5% of the total number of female respondents endorsed the most appropriate option as the most appropriate option. There was a clear margin between the number of male respondents and female respondents that chose the most appropriate option item.

The male respondents accounted for 112 (63.3%) instances of the most appropriate option out of the total instances of the most appropriate option for the item while the female respondents accounted for 65 (36.7%) instances; the margin was 26.6% while the level of significance for item was 0.000. What this suggests is that not all these items behaved the same way; while some items favoured the male respondents, some items favoured the female respondents. However, the result was not the same for all the polytomous test items in the research instrument. There were some of the items that did not display any overwhelming variation as shown by the percentage of instances of the most appropriate options to the items contributed by the male and female respondents.

Moreover, Table 2 above does not only show how different genders had contributed to the total number of instances of the most appropriate options for the twenty polytomous test items, it also shows how competition among options for grammaticality acceptance had been intensified by gender. Gender contributed to grammaticality judgement passed on the options that followed each of the items. The four options under each of the items did not enjoy the same degree of grammaticality judgement; for instance, in item 1, while 112 respondents out of 560 male respondents chose the most appropriate option, 134 chose the more appropriate, 17 chose the option that could be regarded as marginally appropriate and 297 of them chose the least appropriate option as the right options, 65 respondents out 520 male respondents chose the most appropriate option, 108

chose the more appropriate option, 15 chose the option that could be said to be somewhat appropriate and 332 chose the least appropriate option as the correct option. The total number of instances of the most appropriate option was 177 (this means that 177 respondents endorsed it as the appropriate option because the number of acceptance an option got is equal to the number of respondents that endorsed it), for the more appropriate option was 242, for somewhat appropriate was 17 and for the least appropriate was 629. This breakdown showed that there was robust competition between the most appropriate and the more appropriate option. However, the competition between the somewhat appropriate option and the most or more appropriate option was not robust.

The analysis above showed that all the twenty linguistic variables were not sensitive to the social factor against which they were investigated in the same manner. Out of the twelve linguistic variables that displayed a clear margin between the percentages of the most appropriate options contributed to the total instances of the most appropriate options by the two genders, only eight items showed, at least, a margin of 5%. From the foregoing, it could be concluded that gender accounts for syntactic variation in the spoken English of both university and secondary school students.

Research Question 2: Is there any connection between syntactic variation and the levels of education of the individual users or speakers of Nigerian English?

The twenty polytomous test items were subjected to analysis again, but this time, by paying attention to the possible influence that levels of education could have on syntactic variation in the area of grammaticality judgement. X-Calibre 4.2 was used to analyse the data (the data had already been divided into two categories based on the two levels of education of the respondents). The results from the analysis of the data from secondary school respondents and university respondents were later compared so as to know the influence of levels of education on their choices. Table 3 presents the results from the two categories.

Table 3: The Result of Polytomous Test Items under Levels of Education

Item ID	Options by Ranking	University (%: $\frac{x}{540} \times 100$)	Secondary Sch. (%: $\frac{x}{540} \times 100$)	Total (%: $\frac{x}{1080} \times 100$)
1	C	137 (25.4%)	40 (7.4%)	177 (16.4%)
	B	107 (19.8%)	135 (25%)	242 (22.4%)
	D	11 (2%)	21 (3.9%)	32 (3%)
	A	285 (52.8%)	344 (63.7%)	629 (58.2%)
2	D	195 (36.1%)	132 (24.4%)	327 (30.3%)
	C	294 (54.4%)	286 (53%)	580 (53.7%)
	B	36 (6.7%)	34 (6.3%)	70 (6.5%)
	A	15 (2.8%)	88 (16.3%)	103 (9.5%)
3	D	23 (4.3%)	27 (5%)	50 (4.6%)
	A	423 (78.3%)	366 (67.8%)	789 (73.1%)
	B	46 (8.5%)	115 (21.3%)	161 (14.9%)
	C	48 (8.9%)	32 (5.9%)	80 (7.4%)

4	<i>A</i>	267 (49.4%)	412 (76.3%)	679 (62.9%)
	<i>C</i>	228 (42.2%)	89 (16.5%)	317 (29.4%)
	B	27 (5%)	28 (5.2%)	55 (5.1%)
	D	18 (3.3%)	11 (2%)	29 (2.7%)
5	<i>C</i>	182 (33.7%)	94 (17.4%)	276 (25.6%)
	<i>D</i>	195 (36.1%)	211 (39.1%)	406 (37.6%)
	A	105 (19.4%)	214 (39.6%)	319 (29.5%)
	B	58 (10.7%)	21 (3.9%)	79 (7.3%)
6	<i>B</i>	261 (48.3%)	156 (28.9%)	417 (38.6%)
	<i>C</i>	224 (41.5%)	213 (39.4%)	437 (40.5%)
	A	38 (7%)	120 (22.2%)	158 (14.6%)
	D	17 (3.1%)	51 (9.4%)	68 (6.3%)
7	<i>B</i>	232 (43%)	263 (48.7%)	495 (45.8%)
	<i>A</i>	175 (32.4%)	190 (35.2%)	365 (33.8%)
	C	118 (21.9%)	57 (10.6%)	175 (16.2%)
	D	15 (2.8%)	30 (5.6%)	45 (4.2%)
8	<i>B</i>	218 (40.4%)	186 (34.4%)	404 (37.4%)
	<i>C</i>	288 (53.3%)	310 (57.4%)	598 (55.4%)
	A	23 (4.3%)	24 (4.4%)	47 (4.4%)
	D	11 (2%)	20 (3.7%)	31 (2.9%)
9	<i>D</i>	357 (66.1%)	278 (51.5%)	635 (58.8%)
	<i>C</i>	98 (18.1%)	120 (22.2%)	218 (20.2%)
	B	43 (8%)	78 (14.4%)	121 (11.2%)
	A	42 (7.8%)	64 (11.9%)	106 (9.8%)
10	<i>A</i>	283 (52.4%)	214 (39.6%)	497 (46%)
	<i>C</i>	124 (23%)	124 (23%)	248 (23%)
	B	114 (21.1%)	166 (30.7%)	280 (25.9%)
	D	19 (3.5%)	36 (6.7%)	55 (5.1%)
11	<i>D</i>	70 (13%)	32 (5.9%)	102 (9.4%)
	<i>A</i>	279 (51.7%)	118 (21.9%)	397 (36.8%)
	B	55 (10.2%)	37 (6.9%)	92 (8.5%)
	C	136 (25.2%)	353 (65.4%)	489 (45.3%)
12	<i>D</i>	259 (48%)	209 (38.7%)	468 (43.3%)
	<i>C</i>	93 (17.2%)	32 (5.9%)	125 (11.6%)
	A	105 (19.4%)	190 (35.2%)	295 (27.3%)
	B	83 (15.4%)	109 (20.2%)	192 (17.8%)
13	<i>C</i>	366 (67.8%)	321 (59.4%)	687 (63.6%)
	<i>B</i>	125 (23.1%)	106 (19.6%)	233 (21.6%)
	A	33 (6.1%)	103 (19.1%)	136 (12.6%)
	D	16 (3%)	8 (1.5%)	24 (2.2%)
14	<i>C</i>	397 (73.5%)	349 (64.6%)	746 (69.1%)
	<i>A</i>	93 (17.2%)	95 (17.6%)	188 (17.4%)
	B	44 (8.1%)	89 (16.5%)	133 (12.3%)
	D	6 (1.1%)	7 (1.3%)	13 (1.2%)

15	<i>A</i>	421 (78%)	344 (63.7%)	765 (70.8%)
	<i>D</i>	30 (5.6%)	50 (9.3%)	80 (7.4%)
	B	30 (5.6%)	42 (7.8%)	72 (6.7%)
	C	59 (10.9%)	104 (19.3%)	163 (15.1%)
16	<i>C</i>	311 (57.6%)	273 (50.6%)	584 (54.1%)
	<i>D</i>	107 (19.8%)	104 (19.3%)	211 (19.5%)
	B	101 (18.7%)	86 (15.9%)	187 (17.3%)
	A	21 (3.9%)	77 (14.3%)	98 (9.1%)
17	<i>A</i>	258 (47.8%)	164 (30.4%)	422 (39.1%)
	<i>D</i>	126 (23.3%)	153 (28.3%)	279 (25.8%)
	B	117 (21.7%)	183 (33.9%)	300 (27.8%)
	C	39 (7.2%)	40 (7.4%)	79 (7.3%)
18	<i>B</i>	426 (78.9%)	384 (71.1%)	810 (75%)
	<i>A</i>	58 (10.7%)	62 (11.5%)	120 (11.1%)
	D	19 (3.5%)	68 (12.6%)	87 (8.1%)
	C	37 (6.9%)	26 (4.8%)	63 (5.8%)
19	<i>C</i>	156 (28.9%)	264 (48.9%)	420 (38.9%)
	<i>D</i>	309 (57.2%)	193 (35.7%)	502 (46.5%)
	A	30 (5.6%)	53 (9.8%)	83 (7.7%)
	B	44 (8.1%)	30 (5.6%)	74 (6.9%)
	Missing	1 (0.2%)	0 (0%)	1 (0.1%)
20	<i>A</i>	134 (24.8%)	154 (28.5%)	288 (26.7%)
	<i>B</i>	360 (66.7%)	343 (63.5%)	703 (65.1%)
	C	27 (5%)	40 (7.4%)	67 (6.2%)
	D	18 (3.3%)	3 (0.6%)	21 (1.9%)
	Missing	1 (0.2%)	0 (0%)	1 (0.1%)

There was an equal representation of the two levels of education used for this study in the data; that is, there were 540 university respondents and 540 secondary school respondents. For item 1, the university respondents endorsed the most appropriate option 137 (77.4%) times out of the total 177 times while the secondary school respondents accounted for 40 (22.6%) of such instances. This means that more university respondents chose the most appropriate option for the item than the secondary school students that chose the option. This trend was followed while choosing the more appropriate option, however, in a reversed order. The secondary school students accounted for 135 (55.8%) instances of the more appropriate option as the most appropriate option; they accounted for 55.8% of the total 242 instances of the more appropriate option as the right option for the item; this was against the grammaticality judgement of the university students to the total instances of the more appropriate option as the right option, which was 107 (44.2%) of the instances.

From Table 3 above, the university respondents accepted the most appropriate options as the most appropriate options more than the secondary school respondents did while the secondary school respondents endorsed the more appropriate options more than the university respondents did. However, the case was different in items 3, 4 and 19. In these items, the secondary school students contributed to the instances of the most

appropriate options more than the university students did. In items 3 and 4, the secondary school respondents accounted for 27 (54%) and 412 (60.7%) instances of the most appropriate options for the items respectively while the university respondents accounted for 23 (46%) and 267 (39.3%) instances. In item 19, the university respondents contributed 156 (37.1%) instances of the most appropriate option for the item out of the total 420 instances while the secondary students contributed 264 (62.9%) instances. However, the reason for this could be linked to guessing.

Looking at the more appropriate options, on the other hand, the university respondents contributed to the instances of the more appropriate options more than the secondary school respondents did. For instance, in item 4, the university students accounted for 228 (71.9%) instances of the more appropriate option as the most appropriate option for the item out of 317 instances of its occurrence while the secondary school respondents accounted for just 89 (28.1%) instances.

Appreciable variation in the responses of the participants from the two levels of education used for this study was observed mainly in the percentages of respondents that chose the most appropriate options for each of the items as the correct options while no appreciable variation was found in some instances of the more appropriate options. No robust variation was exhibited by respondents that claimed that the more appropriate options for items 2, 5, 6, 7, 8, 14, 16, 18 and 20 were the appropriate options for the items while no variation was observed in 10 in terms of levels of education.

Effect of Gender on Syntactic Variation from Polytomous Test Items

From the analysis presented in Table 3 above, seven out of the twenty polytomous test items exhibited a clear margin of 5% between the responses of male respondents and female respondents. The items that exhibited appreciable margin as far as gender is concerned are 3, 6, 7, 8, 10, 13 and 20. Polytomous test items were generated based on the observation that syntactic variation is not limited to non-standard varieties of English as well as the fact that syntactic variation is not restricted to variation that exists between standard and non-standard varieties of English as viewed by Cheshire (2009).

These seven items that displayed variation based on gender have shown that gender can, to some extent, account for syntactic variation in the English language usage among secondary school and university students in Southwestern Nigeria. Out of the seven items that reached, at least, 5% margin between the number of instances of the options that were judged as the most appropriate options for the items by the male and the female respondents, only one item – item 20 (*They will be attended to **at/by/on/for** 2pm*) – favoured the female respondents; that is, the higher number percentage of instances of the most appropriate options for the item was accounted for by the female respondents while the lower percentage came from the male respondents. The remaining six items – 3, 6, 7, 8, 10 and 13 – favoured the male respondents. These items were said to favour the male respondents because the higher percentages of the instances of the most appropriate options for the items were recorded by the male respondents.

When other options – the more appropriate, the marginally appropriate and the

least appropriate options – were considered, it was discovered that the effect of gender on syntactic variable was still evident. For instance, in item 20 which favoured the female respondents because they chose the appropriate option for the item more than the male respondents did, the male respondents accounted for more instances of the more appropriate option for the item as the most appropriate option than the female respondents did; the male respondents accounted for 367 (52.2%) instances of the more appropriate option while the female respondents' instances amounted to 336 (i.e., 47.8%). This was repeated in the choice of the marginally appropriate option as the most appropriate option for the item; the female respondents were responsible for 22 (32.8%) instances while the male respondents accounted for 45 (67.2%) instances. The result of the analysis of the linguistic variable tested in item 20 contradicts the findings of Jibril (1991). In Jibril's study on prepositional usage and sociolinguistic variables, the researchers found that the linguistic variable in item 20 was not sensitive to gender or education but sensitive to occupation – one of the variables used by the researchers.

This finding seems to debunk the view that women's speech tends to approximate more to the standard variety of English (Jibril, 1991). However, this result might have been influenced by some other social factors which gave the male respondents an edge over the female respondents and, in a way, made the male respondents to move towards the most appropriate options; that is, towards more standard constructions more than the female respondents did. This seems to suggest that gender is a reliable social variable but, as a sole social variable, not as reliable as some other social variables which can be used to account for variation. This assertion is based on the observation that the number of items that were sensitive to gender were not up to the number of items that were sensitive to levels of education.

Influence of Levels of Education on Syntactic Variation Using Polytomous Test Items

As far as the most appropriate options were concerned, all the twenty items that were polytomous in nature were sensitive to education because all of them were within the statistical level of significance, $p < 0.05$ and the number of instances that were accounted for by the male and the female respondents to the total instances of the most appropriate options for the item had, at least, 5% margin. The least margin recorded between the university and the secondary school respondents was 5.2% (Item 18). This means that education is a very reliable social correlate of sociolinguistic behaviour which was measured by using polytomous test items. This is in line with the observation and submission of Jibril (1991).

In most of the items such as 1, 2, 5, 6, 8 and so on, the university respondents chose the most appropriate options for the items as the correct options more than the secondary school respondents did. The secondary school respondents chose the most appropriate options more than the university respondents did only in items 3, 4, 7, 19 and 20. The university respondents chose the most appropriate options more than the secondary school respondents in fifteen items while the secondary school respondents chose them more than their university counterparts did in only five items.

A careful analysis of these polytomous items revealed that variability in the

options that the respondents judged as being the appropriate options for items can be explained in different ways. Variability in the grammaticality judgements of items 7, 10, 11 and 12 that had to do with a choice between overt and covert relativisers can be explained by subscribing to Occam's economy of words. The university respondents chose options that denoted '*no relativiser was needed*' more than the secondary school respondents did; though respondents from the two groups had equal number of instances of a covert relativiser in item 10. In item 7, the secondary school respondents chose a relativiser that was specific – *which* which is used for inanimate antecedents because the antecedent was inanimate – *The dress* – while more university respondents chose a neutral relativiser – *that* which can be used with either animate or inanimate antecedents. In items 11 and 12, on the other hand, the university respondents chose the options that were animacy specific – *which* for 11 and *whom/who* for 12 – because of their antecedents, *All* and *The lady* respectively, more than the secondary school respondents did. What this suggests is that these respondents had some defined pattern of choosing and using relativisers.

Jibril's (1991) work on preposition usage by Nigerian speakers of English explains variability in the usages by subscribing to the view that stable Nigerianism influences choices that people make. The researchers were of the opinion that, since Nigerian English is a stable variety of the language, it has developed its endonormative distinctive features. In item 1, stable Nigerianism was seen at work; Jowitt (1991) submits that, in Standard British English, *for* is the most appropriate option and this variant connotes *at the price of* or *in payment of* as in *The man bought the car for two million naira*. The university respondents chose the first three options in terms of correctness more than the secondary school respondents did. The trace of stable Nigerianism found in the item is that highest percentages of the respondents from the two levels of education endorsed the least appropriate option, but which has garnered acceptance among most of the Nigerian users of English, as the appropriate option for the item.

The result got by comparing levels of education with the analysis of the polytomous test items has established that education has a strong influence on syntactic variation in Nigerian English. This supports and confirms the expectation that people's linguistic performance tends to improve as their levels of education increase. This seems to explain the reason the university respondents chose the most appropriate options as the correct options for fifteen items more than the secondary school respondents did. However, the fact that the secondary school respondents chose the most appropriate options more than the university students did in some items is a proof that a social variable cannot give a full picture of what influences syntactic variation.

The two social variables against which the polytomous test items were analysed made the items to display different patterns of syntactic variation among the options that followed each of the items. While gender did not influence grammaticality judgements passed on the options that followed all the items and those that it did influence were not influenced in the same manner, education was found to influence all the items and it influenced the grammaticality judgements that some of the options that followed some of the items got. Gender influenced competition among the options but most of the options

engaged in an overwhelming competition to the extent of not knowing the dominant variants. However, education helped us to observe that the competition among some items was not robust as it seemed as if the dominant variants were driving out the weak competing forms.

Conclusion

In conclusion, the results from the analyses of the polytomous items have confirmed the submission of Hundt (2006) that Standard English is 'not a monolithic entity' that is limited to only one syntactic structure or choice in order to express an idea. The results have also shown that there are some non-linguistic factors that do influence syntactic variation. As the result of the results from this study, the degree of sensitivity of syntactic variation in Standard English to education may not be appreciably different from its sensitivity to gender. However, the level of education has a greater influence on syntactic variation between Standard English and non-standard English than does gender.

References

- Achebe, C. (1975). *Morning yet on creation day*. London: William Heinmann.
- Akande, A. T. (2013). Non-standard syntactic features in Nigerian university graduates' English. *Awka Journal of English Language and Literary studies*, 4(1), 15-27.
- Akande, A. T. & Okanlawon, B. O. (2011). Standard English in Nigerian graduates' speech. *GEGE: Ogun Studies in English*, 8, 196-214.
- Akindele, F. & Adegbite, W. (2005). *The sociology and politics of English in Nigeria: An introduction*. Ile-Ife, Nigeria: Obafemi Awolowo University Press.
- Bhatt, R. M. (2001). World English. *Annual Review of Anthropology* 30, 527-550. Retrieved on 14th June, 2017 from www.jstor.org/stable/3069227
- Britain, D. (2010). Grammatical variation in the contemporary spoken English of England. In A. Kirkpatrick (Ed.), *Handbook of World English* (pp. 37-58). Oxon, OX: Routledge.
- Cheshire, J. (2003). Social dimensions of syntactic variation: The case of *when* clauses. In D. Britain and J. Cheshire (Eds), *Social dialectology: In honour of Peter Trudgill* (pp. 245-262). Amsterdam, Netherland: John Benjamins.
- Cheshire, J. (2009). Syntactic variation and beyond. In N. Coupland & A. Jaworski (Eds.), *The new sociolinguistics reader* (pp. 119-135). New York, NY: Palgrave Macmillan.
- Coulmas, F. (1998). Introduction. In F. Coulmas (Ed.), *The handbook of sociolinguistics*. Blackwell Online. Retrieved from www.gen.lib.rus.ec on 10th May, 2017.
- Guy, G. R. (2011). Variation and change. In W. Maguire and A. McMahon (Eds),

- Analysing variation in English* (pp. 178-188). Cambridge, United Kingdom: Cambridge University Press.
- Hambleton, R. K., Swaminathan, H., & Rogers, H. J. (1991). *Measurement methods for the social sciences series, Vol. 2. Fundamentals of item response theory*. London: Sage Publications, Inc.
- Hundt, M. (2006). *The committee has/have decided ...*: On concord patterns with collective nouns in Inner- and Outer-Circle varieties of English. *Journal of English Linguistics*, 34(3), 206-232. Retrieved from www.eng.sagepub.com on 21st November, 2016.
- Igboanusi, H. (2006). Syntactic innovation processes in Nigerian English. *Studia Anglica Posnaniensia* 42, 393-404. Retrieved on 26th January, 2017 from www.researchgate.net/publication/237114931_syntactic_innovation_processes_in_nigerian_english
- Jibril, M. (1991). The sociolinguistics of prepositional usage in Nigerian English. In J. Cheshire (Ed.), *English around the world: Sociolinguistic perspectives* (pp. 519-544). Cambridge, United Kingdom: Cambridge University Press.
- Jowitt, D. (1991). *Nigerian English usage: An introduction*. Lagos, Nigeria: Longman.
- Kallen, J. L. (1991). Sociolinguistic variation and methodology: *After* as a Dublin variable. In J. Cheshire (Ed.), *English around the world: Sociolinguistic perspectives* (pp. 61-74). Cambridge, United Kingdom: Cambridge University Press.
- Labov, W. (1969). Contraction, deletion and inherent variability of the English copula. *Language* 45, 715-762. doi: 10.2307/412333
- Lopez, G. E. (2012). Detection and Classification of DIF Types Using Parametric and Nonparametric Methods: A comparison of the IRT-Likelihood Ratio Test, Crossing- SIBTEST, and Logistic Regression Procedures. *Graduate Theses and Dissertations*.
- McMahon, A. & Maguire, W. (2011). Introduction. *Analysing variation in English: What we know, what we don't and why it matters*. In W. Maguire and A. McMahon (Eds), *Analysing variation in English* (pp. 1-4). Cambridge, United Kingdom: Cambridge University Press.
- Ohakamike, O. N. (2016). Syntactic variation in Nigerian English and students' achievement in English language. *IOSR Journal of Humanities and Social Science* 21(7), 131-139. Retrieved from www.iosrjournals.org on 20th August, 2017.
- Roberts, N. S. (2014). *A sociolinguistic study of grammatical variation in Martinique French* (Doctoral Dissertation, Newcastle University, Newcastle). Retrieved from

www.theses.ncl.ac.uk/dspace/handle/10443/2871 on 10th June, 2017.

- Schluter, J. (2005). *Rhythmic grammar: The influence of rhythm on grammatical variation and change in English*. Berlin, Germany: Mouton de Gruyter.
- Tagliamonte, S. A. (2006). *Analysing sociolinguistic variation*. Cambridge, United Kingdom: Cambridge University Press.
- Tagliamonte, S. A. (2009). *Be like*: The new quotative in English. In N. Coupland and A. Jaworski (Eds.), *The new sociolinguistics reader* (pp. 75-91). Hampshire, United Kingdom: Macmillan.
- Tagliamonte, S. A. (2016). *Making waves: The story of variationist sociolinguistics*. West Sussex, United Kingdom: Blackwell.
- Taiwo, R. (2012). Morpho-syntactic features of Nigerian English. In B. Kortmann and K. Lunkenheimer (Eds.), *The Mouton world atlas of variation of English* (pp. 410-416). Berlin, Germany: Mouton de Gruyter.
- Tunde-Awe, B. M. (2014). Nativisation of English language in a multilingual setting: The example of Nigeria. *Academic Journal of Interdisciplinary Studies* 3(6), 485-492. doi: 10.5901/ajis.2014.v3n6p485.
- Wardhaugh, R. (2006). *An introduction to sociolinguistics* (5th Edition): Malden, MA: Blackwell.

RELATIONSHIP BETWEEN SENIOR SECONDARY SCHOOL STUDENTS' PERSONAL SOCIAL VARIABLES AND THEIR ACADEMIC ACHIEVEMENT

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&

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Abstract

The study investigated the relationship between students' personal social variables and senior secondary school students' achievement in Jos South LGA, Plateau State, Nigeria. The population of the study comprised 2,560 SS 2. The survey made use of simple random sampling in selecting 346 students from seven schools in Jos South LGA from the population to participate in the study. The students responded to two valid instruments: students' personal social variables rating scale, and mathematics achievement test. The students' personal social variables rating scale comprised of 40 questions which measured two variables (attitude and self-concept) while the mathematics test consisted of 60 questions which measured students' performance at three cognitive levels. Data analysis involved the use of multiple regression analysis and SPSS. Results found that students' personal social variables are joint predictors of senior secondary school students' mathematics achievement. It is concluded that personal social factors (attitude and self-concept) are responsible for students' achievement in mathematics. It is therefore recommended that students should develop very good attitude and engage themselves more in studying mathematics. In addition, teachers and parents should try and build self-confidence in their wards/students in order to boost students' interest in learning mathematics and improve their attitude towards the subject.

Key words: Personal social, attitude, self-concept, academic achievement.

Introduction

While Education is a key to economic growth of a country as well as in science and technology, science and technology education are very important and crucial factors for the development of any nation. There is no doubt that what distinguishes the developed nations from the developing nations of the world is the degree of science and technology prevalent in these nations and mathematics is the fulcrum on which science and technology rotate.

The significance of mathematics in producing versatile and resourceful graduates that are needed for economic development cannot be over-emphasized. The Science Teachers Association of Nigeria referred to mathematics as the central intellectual

discipline of the technology societies. The objectives of teaching mathematics in secondary schools make it very important as a foundation subject for success in further academic endeavor and manpower development. In view of this, the learning of mathematics in schools represents a basic preparation for adult life and secondly a gateway to a vast array of career choices. In this respect, Iji (2007) maintained that any country that aspires for national growth in science, industries, and technology must not neglect mathematics. This is in view of the multi-dimensional values of mathematics in virtually all facets of human development and experience. The former Minister of Education, Rufa'i, who stated in Abuja at the flagging-off of the 2012 Nigeria Mathematical Year held at the Shehu Musa Yar'Adua center, Abuja with the theme: Mathematics, Key to National Transformation, that the trend of poor performance in mathematics must be checked if the country has to move forward. She expressed sadness that Nigeria has remained largely a consumer nation because of lack of investment in science and technology in the past. She said there could be no meaningful progress in the country without promoting the study of mathematics (Rufa'i, 2012).

From investigations, most secondary schools record the same pattern of poor mathematics performances year in, year out. The prediction of success or failure in mathematics is quite often based on cognitive variables usually assessed on Wechsler's (1996) intelligence scale. In an attempt to improve such predictions, there has been an upsurge of interest within the past few years on non-cognitive variables such as attitude, self-concept, but to mention a few.

Researches have shown that the behavior of students especially in relation to the sciences, generally and mathematics in particular is greatly influenced by certain psychological or non-cognitive factors. For example, Afemike (1985) found out that self-concept, attitude towards mathematics, sex-stereotyping, confidence, motivation and problem-solving habit are all related to students' achievement. Other psychological factors which influence the performance of secondary school students in mathematics include self-concept, locus of control, study habit, career plan/aspiration, attitude towards mathematics, motivation, interest in schooling (Umoinyang, 1999).

Academic achievement can be defined as excellence in all academic disciplines, in class as well as extracurricular activities. Academic achievement is the outcome of education as it indicates the extent to which the student, teacher, curricular and indeed the educational institution has achieved the predetermined educational goals. Academic achievement is commonly measured with examinations that assess important procedural knowledge such as skills, and declarative knowledge such as facts which students have learnt (Engel, 2002; Bennett, 2003; Bishin, 1973).

Attitude can be viewed as a person's feelings of like or dislike of a particular situation, event or activity. Attitude can be defined as our response to people, places, things, or events in life. It can be referred to as a person's viewpoint, mindset, beliefs, etc. (Buzzle, 2016). Our attitude towards people, places, things, or situations determines the choices that we make. Attitude is composed of three components, which include cognitive, affective/emotional component, and behavioral component. Basically, the

cognitive component is based on the information or knowledge, whereas affective component is based on the feelings. The behavioral component reflects how the attitude affects the way we act or behave to such situation (Buzzle, 2016). He is also of the opinion that the attitude of a person towards an event, a thing or situation is essentially like an evaluative statement that is either positive or negative depending on the degree of like or dislike for the matter in question.

Attitude of an individual to any situation has been categorized in to three depending on the way he/she reacts to such situation or thing. Buzzle (2016) categorized and explained three types of attitude which are positive attitude, negative attitude and neutral attitude. The attitude of students towards school subjects has been viewed as a significant predictor of their academic achievement in such subjects. Students with positive attitudes show better performance than those with negative and neutral attitudes (Depaolo & McLaren, 2006). This implies that for students to perform at desirable levels, their attitudes must be shaped towards such subjects to be positive.

Researches have supported the belief that there is a persistent and significant relationship between self-concept and academic achievement and the change in one seems to be associated with a change in other (Marsh, 1992). Olantunde (2010) showed that students who have positive self-concept of themselves performed well in mathematics. Studies have also shown that better self-concept is associated with better scholastic achievement test (Raju, 2013) and has a significant relationship with academic achievement (Sikhwara, 2014; Archana & Chamudeswari, 2013).

The most influential and eloquent voice in self-concept theory was that of Carl Rogers who introduced an entire system built around the importance of the self (Hattie, 1992). In Rogers' view, the self is the central ingredient in human personality and personal adjustment. Rogers described the self as a social product, developing out of interpersonal relationships and striving for consistency. He maintained that there is a basic human need for positive regard both from others and from oneself. He also believed that in every person there is a tendency towards self-actualization and development so long as this is permitted and encouraged by an inviting environment. Self generally means the conscious reflection of one's own being or identity, as an object separate from others or from the environment. There are a variety of ways to think about the self. Two of the most widely used terms are self-concept and self-esteem. Self-concept is the cognitive or thinking aspect of self (related to one's self-image) and generally means the totality of a complex, organized, and dynamic system of learned beliefs, attitudes and opinions that each person holds to be true about his or her personal existence (Purkey & Schmidt, 1987). Self-concept can also mean the general idea we have of ourselves. The idea of self-concept includes attitudes, feelings and knowledge about ability, skills, and social acceptance capability of the self. Self-concept covers all aspects of our cognitive, perceptual, and affective evaluation. Therefore, self-concept is simply a collection of personal attitudes towards oneself (Gross, 1992).

The main purpose of the study is to empirically determine the relationship between students' personal social variables and senior secondary school students' academic

achievement. The objectives of the study were: find out the secondary school students' attitude to mathematics; find out the relationship between students' self-concept and their achievement in mathematics; determine the relationship between the personal social variables (interest, study habit, attitude, self-concept) and academic achievement.

Research Questions

In order to achieve the objectives of the study, the following research questions were raised:

1. What is the nature of students' attitude to mathematics?
2. To what extent does self-concept relate to senior secondary school students' academic achievement in mathematics?
3. What is the relationship between students' personal social variables and achievement in mathematics in Jos South LGA?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between students' attitude to mathematics and their performance in the subject.
2. The self-concept of senior secondary students will not be significantly related to their achievement in mathematics.
3. Personal social variables are not significantly related to students' academic achievement in mathematics.

Method

The study employed a correlation survey design. The population for this study comprised all SS 2 students in all public and private senior secondary schools in Jos South Local Government Area of Plateau State. Available statistics show that there are 2,560 students in 103 registered private and 20 public secondary schools which makes a total of one hundred and twenty-three (123) schools in Jos South local government area of Plateau state (source: Plateau State Ministry of Education, 2020). Data was collected from a sample of 346 SS 11 students sampled from the population of SS 11 students of Jos South Local Government Area. The sample for the study was drawn from the seven senior secondary schools in Jos South Local Government Area. The sample was made up of 185 males (53.5%) and 161 females (46.5%). The population was stratified into the homogeneous groups of public and private senior secondary schools. Subsequently, seven (7) secondary schools were drawn from the one hundred and twenty-three (123) secondary schools in Jos South local government area for the study using simple sampling technique. Simple random sampling technique was used in order to select schools with large population of SS II students. A stratified random sample of 346 was drawn with the aid of table of random numbers from the 2,560 senior secondary school 2 students in the 2019/2020 academic year. The sample size of 346 was arrived at using the Taro Yamane formula $n = \frac{N}{1 + N(e)^2}$. The instruments for data collection of this study were structured questionnaire developed and used by the researcher on the personal social variables affecting students' achievement in mathematics and the exams scores of SS 2 students in mathematics. The structured questionnaire consists of five sections; Section A elicits information on the personal data of the student such as name of the school, gender,

and class. Section B- E contains items on the various identified personal social factors affecting students' achievement. The performance of SS 2 students in mathematics was gotten immediately after their promotion examinations was conducted. Two research instruments were used by the researcher. One of the research instruments was developed by the researcher and validated by measurement and psychology experts. The second research instrument was the participants' promotion test scores in mathematics. The items on the personal social variable assessment questionnaire were developed by the researcher after an extensive review of literature and careful scrutiny by measurement and psychology experts. The items of each section were formulated based on the traits the researcher wants to measure from each section. After the items were formulated, two measurement and one psychology experts scrutinized the items, made necessary corrections which were effected by the researcher and the instruments were subject to judgment by experts. The data collected were analyzed via statistical package for Social Science, SPSS version 22. The main statistical methods used to answer research questions were descriptive statistics, Pearson Product Moment Correlation Coefficient and multiple regression.

Results

Table 1: Nature of Students' Attitude to Mathematics

S/N	Nature of Attitude	N	%
1.	Negative	308	89
2.	Neutral	24	7
3.	Positive	14	4
	Total	346	100

Table 1 shows the percentage result on the nature of attitude of students to mathematics in senior secondary schools in Jos South LGA. From the result, 308 students representing 89% had negative attitude towards mathematics, 24 had neutral attitude, while 14 had positive attitude towards mathematics in senior secondary schools in Jos South LGA.

Table 2: Relationship between Self-Concept and Academic Achievement in Mathematics

Variables	N	$\bar{x}$	SD	r
Self-Concept	346	20.16	10.37	.721
Achievement	346	46.13	9.42	

Table 2 shows the result of correlation between students' self-concept and achievement in mathematics in Jos South LGA. The result shows a correlation coefficient of .721, indicating that there is a strong positive relationship between self-concept and achievement of students in mathematics.

Table 3: Relationship between Students' Personal Social Variables and Achievement in Mathematics

Variables	Achievement	Study Habit	Interest	Attitude	Self-Concept
Achievement	1				
Attitude	.699	.765	.909		
Self-Concept	.721	.746	.914	.870	1

The relationship between attitude and self-concept shows a coefficient of .870, indicating that there is a strong positive relationship between the two variables.

Table 4: Result of Analysis on Relationship between Students' Attitude and their Academic Achievement in Mathematics

Variable	N	X	SD	DF	r	p-value
Attitude	346	20.05	9.58	344	.699	.000
Achievement	346	46.13	9.79			

$p < 0.05$

Table 4 shows the result of correlation on the relationship between attitude and achievement in mathematics. The result yielded $r(344) = .699$, $p < 0.05$. Since the P-value of .000 is less than 0.05 level of significance, the null hypothesis was rejected. It was concluded that there is a significant strong relationship between students' attitude and academic achievement in mathematics in Jos South LGA.

Table 5: Result of Analysis on Relationship between Students' Self Concept and their Academic Achievement in Mathematics

Variable	N	X	SD	DF	r	p-value
Self-Concept	346	20.16	10.37	344	.721	.000
Achievement	346	46.13	9.79			

$p < 0.05$

Table 5 shows the correlation between self-concept and academic achievement in mathematics in Jos South LGA. The result revealed that $r(344) = .721$, $p < 0.05$, indicating a strong positive relationship between the two variables. Since the p-value of 0.00 is less than 0.05 level of significance, the null hypothesis was rejected, it was concluded that there is a significant relationship between self-concept and students' achievement in mathematics.

Table 6: Model Summary showing Relationship between Students' Personal Social Variables and Academic Achievement in Mathematics.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.750	.563	.557	6.510

Table 6 reveals the model summary showing the relationship between students' personal social variables and academic achievement in mathematics. The result yielded a regression coefficient of .750, coefficient of multiple determination of .563 and the adjusted R-Square of .557. It indicates that students' personal social variables do significantly relate to students' academic achievement. It was deduced that 56.3% of the variation in students' achievement is due to attitude and self-concept, while 43.7% of the variation is due to other variables not investigated in the study.

Discussion

The findings on the nature of students' attitude to mathematics revealed that there is a significant strong positive relationship between students' attitude and academic achievement in mathematics in Jos South LGA. This in line with a study conducted by Muhammed and Awan (2013) which showed a positive relationship between attitude and academic performance in Research methods and statistics.

The findings on students' self-concept and academic achievement in mathematics showed a strong positive relationship between the two variables. It also revealed that there is a significant relationship between self-concept and students' academic achievement in mathematics. This confirms the finding of Olatunde (2010) which showed that students who have positive self-concept of themselves performed well in mathematics.

The findings from the relationship between students' personal social variables and academic in mathematics in Jos South LGA revealed a correlation between attitude and achievement, self-concept and achievement respectively indicating a strong positive relationship between the two variables which means there is a strong positive relationship between attitude and self-concept.

Conclusion

Based on the findings of the study, it can also be concluded that personal social variables such as attitude towards mathematics and students' self-concept in mathematics have varying degree of effects on students' achievements in mathematics. While there is a positive strong relationship between students' attitude towards mathematics as well as students' self-concept and their academic achievement. This implies that students must develop good self-concept, interest and a good study habits for an improved academic achievement in mathematics.

Recommendations

On the basis of the findings of the study, the following recommendations were made:

1. It was recommended that students should develop very good study habits and engage themselves more in studying mathematics.
2. Teachers should desist from making statements that can make students develop poor self-concepts and attitude in mathematics.
3. Individual self-concept and attitude are important factors in the choice of goals and expected level of performance in mathematics. Mathematics teachers are therefore tasked to know their students and strengthen their self-concept.

Students should have a positive self-concept in mathematics by having the belief that mathematics is not a difficult subject.

References

- Akey, T. M. (2006). *School context, student attitudes and behavior, and academic achievement: An exploratory analysis*. New York: MDRC. Retrieved January 28, 2021 from <http://www.mdrc.org/publications/419/full.pdf>.
- Abesha, A. G. (2012). Effects of parenting styles, academic self efficacy, and achievement motivation on the academic achievement of university student in Ethiopia. Doctoral dissertation. Edith Cowan University, Perth, Western Australia.
- Achor, E. E., Imoko, B. I., & Jumin, N. (2012). Improving some Nigerian secondary school students' Achievement in Geometry; A field Report on Team Teaching. *New York Science Journal*, 5(1), 37-43. Retrieved March 3, 2014 from <http://wwwsciencepub.net/newyork/ny0501/0077175ny05013143pdf>.
- Abdullahi, O. E., & Onasanya, S. A. (2010). Effects of teachers' effectiveness on Kwara State secondary school students' achievement in mathematics. *The Social Sciences*, 5(4), 286-292.
- Adediwura, A. A., & Tayo, B. (2007). Perception of teachers' knowledge, attitude and teaching skills as predictors of academic performance in Nigerian secondary schools. *Educational Research and Review*, 2(7), 165-171.
- Ahias, M., Akasa, Z. A., & Kesot, M. J. (2012). Self-efficacy, locus of control and attitude among Engineering students: Appreciating the role of affects in learning efforts. *Procedia-social and Behavioral Sciences*, 56, 183-190.
- Ajaji, K. O., Lawani, A. O., & Adeyanju, H. I. (2011). Effects of students' attitude and self-concept on achievement in senior secondary school mathematics. *Journal of Research in National Development*, 9(2), 81-86.
- Bot, T. D., & Illiya, G. (2015). Effectiveness of programmed instructional strategy on senior secondary school students' achievement in trigonometry in Mangu, Plateau State. Abacus: *Journal of the Mathematical Association of Nigeria (MAN)* 40(1), 101-111.
- Byrne, B. M. (1984). The general academic self-concept technological network: A Review of construct validation research. *Review of Educational Research*, 54, 427-456.
- Byrne, B. M. (1984). The general academic self-concept technological network: A Review of construct validation research. *Review of Educational Research*, 54, 427-456.
- Dave. (1979). Predictors of academic achievement and academic self concept: A Longitudinal perspective. *British Journal of Educational Psychology*, 67(3), 63-77.

Ernest, P. (2004). Images of mathematics, values and gender. In S. Johnston-Wilder & B. Allen (Eds.), *Mathematics Education: Exploring the culture of learning*. Routledge.

ASSESSING THE EFFECT OF META-COGNITIVE INSTRUCTIONAL STRATEGIES ON STUDENTS' ACADEMIC ACHIEVEMENT AND ENGAGEMENT IN MATHEMATICS

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Abstract

The study assessed the effect of explicit instruction, journal writing and question generation as meta-cognitive strategies on secondary school students' academic achievement and engagement in Mathematics. A total of 100 SS2 students from Michael Okpara University of Agriculture demonstration secondary school Umudike, Abia State of Nigeria were used for the study which adopted a quasi-experimental design. Two research questions and four hypotheses guided the study. Data collected using validated Mathematics achievement test and engagement scale were analyzed using mean and analysis of covariance. Results indicate higher achievement and engagement mean scores for students exposed to metacognitive strategies than those exposed to conventional learning strategies. Students exposed to question generation emerged as the best in both achievement and engagement tests. The research recommends incorporation of explicit instruction, journal writing and question generation in teaching and learning of Mathematics and other subjects in secondary schools; organization of in-service training by the Ministry of Education to enlighten Mathematics teachers on how to apply these meta-cognitive strategies while teaching. Application of meta-cognitive strategies should be included in the curriculum of teacher education to expose student teachers to proper use of meta-cognitive strategies during their training.

Key words: Meta-cognitive Strategies, Explicit Instruction, Journal Writing, Question Generation, Engagement, Achievement and Mathematics

Introduction

The relevance of mathematics to Sciences, Technology and everyday life cannot be overemphasized. This is evident in the aims and objectives of secondary school mathematics as stipulated in the National policy of Education. According to the policy, the objectives of secondary school mathematics include;

- The inculcation of the right type of value and attitude for survival of the individual and the Nigeria society;
- To provide necessary mathematical background for higher learning;
- The acquisition of appropriate skills, abilities and competencies both mental and physical equipped for the individual to live and contribute to the development of his society;
- To develop precisely logical and abstract thinking;
- To encourage creativity;
- To develop the ability to recognize problem and to solve them with related

- mathematical knowledge;
- To foster the desire and ability to be accurate to a degree relevant to the problem at hand;
- To develop interest for mathematics and provide a solid foundation for everyday living (Federal Ministry Education [FME], 2013).

In order to achieve the objectives of secondary school mathematics and to develop necessary skills for problem solving and critical thinking, a student must recognize what he knows and be able to process it. Thus, there is need to improve students' meta-cognitive skills to address the present scenario (Gaylo & Dales, 2017). Based on current educational theories, educational activities should be designed to maximize learners' opportunities to construct meaningful personal knowledge and develop higher – order thinking abilities, such as meta-cognition which has been shown as the most important factor contributing to learning (American psychological Association (APA) in Mok, 2005). This concept or idea is supported by Wanner (2015) who noted that students want interactivity and active learning and that learning is shifting from teachers to more students – centered approaches. This means a shift in pedagogies to constructivist teaching practices that entails engaging students fully during teaching and learning activities. This calls for the use of meta-cognitive teaching strategies.

According to Agulanna and Nwachukwu (2014), meta-cognition is the mental process whereby one monitors one's cognitive process in thinking, learning and remembering: or knowledge about one's own cognitive system or knowing how to learn. It includes interpretation of on – going experience, or simply making judgments about what one knows or does not know to accomplish a task, as other features of meta-cognition, the authors added. Farahiam (2015) defined meta-cognition as a sum total of the executive functions that influence actions or the ability to recognize and examine thinking patterns. Furthermore, Mansoor et al. (2014) offered a more comprehensive definition of meta-cognition as the knowledge of one's own cognition and effective processes and states, as well as the ability to consciously and deliberately monitor and regulate those processes and states. Hence meta-cognition can be seen as a regulatory system that helps a person understand and control his or her own cognitive performance. Meta-cognition has two broad categories namely: knowledge of cognition which refers to activities that involve conscious reflection of one's cognitive ability and regulation of cognition which refers to activities regarding self – regulatory mechanisms during an ongoing attempt to learn (Jaleel & Premachandran, 2016). Meta-cognition is simply defined by Lai (2011) as “thinking about thinking”. It is the ability to control one's own thinking processes in problem solving and higher order thinking. With meta-cognition, skills are developed and less developed meta-cognitive skills imply poor achievement (Sahir & Kinder, 2013). Thus, the issue of improving meta-cognitive skills of students should be the concern of the teachers.

A meta-cognitive instructional strategy can simply be defined as a memorable “plan of action” that provides students easy procedures to follow while learning in their own time. In the words of Wong (2012), meta-cognitive strategies help to develop in students, a deeper understanding of concepts; takes the students thinking to a higher level, and steer

students into adulthood. Meta-cognitive strategies need to be taught. In other words, students should be taught how to study and how to learn effectively. This is especially true for students who have difficulty understanding concepts. Also, the recent emphasis on computer assisted instruction through online training programs makes it imperative for students to know how to learn through development of their metacognitive skills. Meta-cognitive strategies are sets of skills that aid learners to become aware of how they learn and to evaluate and adapt these skills to become increasingly effective at learning. Hence metacognitive strategies refer to conscious monitoring of one's cognitive strategies to achieve desired results. These strategies permit students to use their meta-cognitive skills. Meta-cognitive instructional strategies are capable of helping students to develop their learning process and evaluate themselves. According to Archer and Hughes (2011), meta-cognitive strategies encompass the following amongst many others: asking questions, fostering self – reflection, encouraging self – questioning, promoting autonomous learning, solving problems with a team, thinking aloud, self – explanation and providing opportunities for making errors. Examples of meta-cognitive strategies include: concept mapping, think-pair-share, journal writing, think – aloud, explicit instruction, self-questioning among others.

In a world that demands lifelong learning, providing people with new and improved meta-cognitive strategies is a gift that can last forever. It then follows that since meta-cognitive strategies could help students develop a deeper understanding of what they are being exposed to, it becomes worthwhile to incorporate these strategies in students' learning at secondary schools. This can be done through the use of explicit instruction, journal writing and student generated questions, among others.

According to Iwai (2016), explicit instruction involves directing students' attention towards a specific instructional objective in a highly structured environment. It is a type of meta-cognitive strategy which enhances students thinking process (engaging their minds). Lessons are taught in a logical and sequential order directed by the teacher or facilitator through demonstration, explanation and practice. In explicit instruction, the teacher sets the stage for learning by explaining to the students in a detailed manner, the purpose for the lesson being taught, what to do, model the process of how to do it, and guide the students with practice (Orlich et al., 2010). Explicit instruction is a teaching strategy which comprises a sequence of supports including setting the stage for learning; clear explanation of what to do, modeling the process, guided practice, independent practice and assessment / closure (informal or formal) (Little & Delisio, 2015). In line with this, Sullivan (2017) identified three main components of explicit instruction to include opening of the lesson, body of the lesson and closing of the lesson. Furthermore, Archer and Hughes (2011) compiled and organized the tenets of explicit instruction to include: Focus instruction on critical content, sequence skills / contents logically, break down complex skills / concepts and strategies into smaller instructional units, design organized and focused lessons; begin lessons with a clear statement of the lesson's goal and your expectations, review prior skills and your knowledge before beginning instruction, provide step – by – step demonstrations; use clear and concise language; provide an adequate range of examples and non – examples, provide guidance and supported practice, require frequent responses, monitor student performance closely, provide

immediate affirmative and corrective feedback, deliver the lesson at a brisk pace, help students organize knowledge and provide distributive and cumulative practice. According to Archer and Hughes (2011), the use of explicit instruction models is the most effective way to ensure that students understand the purpose of a meta-cognitive strategy, how to use it, and under what circumstances it should be used.

Another important aspect of meta-cognitive strategy is self-explanation. Self-explanation in writing or speaking can help learners improve their comprehension of a difficult concept. Self-explanation in writing otherwise known as journal writing can help the students develop meta-cognitive awareness in order to become successful independent Learners. It can also help students monitor their learning strategies so that they know when they are accomplishing their goals and when they are not. Thus, another metacognitive strategy that can enhance cognitive skill and achievement is the introduction of journal writing. Journal writing entails students giving a comprehensive written report of the instructional activities beginning from statement of instructional objectives to evaluation of the lesson. Journal writing enables students to monitor their learning progress on what they know, their difficulties and how to overcome it. Hacker et al (2009) described writing as applied meta-cognition because thinking is integrated into every part of the writing process.

Students' engagement is the quality and quantity of students' psychological, cognitive, emotional and behavioral reactions to the learning process as well as to in – class and out – of – class academic and social activities to achieve successful learning outcomes (Gunuc, 2014). The author further stated that even the most effective teaching strategies alone do not merit successful learning process without students' engagement. Coates (2008:1) defines student engagement as “students' involvement with activities and condition likely to generate high – quality learning” Kuh (2009: 683) stated that “student engagement represents the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities”. According to Jaayapraba (2013), the use of meta-cognitive strategies ignites ones thinking and can lead to better learning and higher performance.

Determination of students' academic achievement is done using an achievement test. Achievement test is a test that measures the degree to which a student has acquired certain information often as a result of instruction or training. Achievement test is designed to determine the extent to which testees have achieved mastery of specified objectives of lesson, which they have been taught as at the time of testing (Abakpa, 2011). In the view of Nworgu (2015), the essence of achievement test is to determine the degree of attainment of individuals in tasks, courses or programmes to which the individuals were sufficiently exposed.

The conventional method of teaching Mathematics in most secondary schools in Nigeria involves expository and demonstration where by the teacher explains the concept, solves illustrative examples and gives assessment questions in form of class works and assignment. This method is predominantly teacher centered. Contrary to this, Ibe (2015) opined that science and Mathematics educators should adopt learner – centered innovative

strategies which will engage them creatively and enhance their meta-cognition.

As noted by Ganyaupfu (2013), the teaching strategies adopted in the classroom affect students' academic achievement. A good number of studies have been conducted by different scholars to investigate the effect of different meta-cognitive strategies on students' engagement and achievement in different subjects. Gaylo and Dales (2017) investigated the effects of meta-cognitive strategies on students' academic achievement and engagement in mathematics, using a sample of 60 Grade 9 students selected from Aplaya National High School, Schools Division of Misaruis Oriental, Philippines. Data collected using researcher – made academic achievement test and engagement scale in mathematics were analyzed using Mean and standard deviation, one-way analysis of covariance (ANCOVA) and Pearson Product Moment Correlation. Findings revealed better academic achievement of Grade 9 students when taught using meta-cognitive strategies than the students taught with the conventional teaching strategies. Also, significant positive relationship exists between students' academic achievement and engagement in mathematics. Mevarech and Amrany (2008) investigated the effects of meta-cognitive instruction on regulation of cognition and mathematics achievement. The researchers adopted a quasi – experimental design for the study. Data collected using interview schedule administered on 61 Israeli high school students who studied mathematics for four – point credit on the matriculation exam (middle level) were analyzed using both quantitative and qualitative methods. Results indicated that students in experimental group out – performed their counterparts on mathematics achievement and regulation of cognition, but not on knowledge about cognition.

Tavakoli and Koosha (2016) carried out a study on the effect of meta-cognitive strategy (explicit instruction) on reading comprehension and self – efficacy beliefs in English as a Foreign Language among students in Iranian Universities. Data collected from 60 students using rating scales were analyzed using mean, standard deviation and ANCOVA. The results of the study revealed that students in the experimental group (explicit instruction) showed greater achievement both in reading comprehension and self – efficacy than students in the control group. Similarly, Abeer (2016) investigated the effect of explicit instruction meta-cognitive strategies on reading comprehension among Jordanian university students using quasi – experimental design. An achievement reading comprehension test of twenty multiple choice questions was used to collect data for analyses. The results prove that the teaching on the basis of the meta-cognitive strategies instructions was successful to develop the students' ability to learn vocabulary. Also, Iwai (2016) examined the impact of explicit instruction on reading strategies among 18 K – 8 teacher candidates in a literacy methods course in the United States of America. Instrument used for collecting data was an adapted rating scale titled Meta-cognitive Awareness of Reading Strategies Inventory (MARSİ). Data analyzed using a paired t – test revealed that there was a statistically significant difference between pre – and post – MARSİ in the Global Reading Strategies (GLOB) category, indicating that the teacher candidates increased their awareness of meta-cognitive reading strategies after the intervention.

Another study was carried out by Safari and Meskini (2016) on the effect of meta-

cognitive instruction on problem solving skills in Iranian students of Health Sciences. The study sample included 40 students studying in the second semester at Kermanshah University of Medical Sciences, 2013 – 2014. They were selected through convenience sampling techniques and were randomly assigned into two equal groups of experimental and control. For the experimental group, problem solving skills were taught through metacognitive instruction and for control group, problem solving skills were taught via conventional teaching method. The instrument for data collection included problem solving inventory, which was administered before and after instruction. Data collected were analyzed by descriptive statistics, mean and standard deviation and the hypotheses were tested by *t* – test and ANCOVA. The findings indicate a significant difference between experimental group and control group in favor of the experimental group. Also, Van et al. (2015) carried out a study to find out the effects of explicit instruction of metacognition on visual arts performance of students. The results of analyses done using mean marks, standard deviation and Analysis of Covariance (ANCOVA), showed that students exposed to explicit instruction performed better than students in the control group at post – test in visual arts.

Hazelwood (2015) explored the effects of the use of active learning and relevance – building strategies like think – pair – share in maintaining student engagement. With the use of an engagement survey given on the first and final lecture, it was discovered that there is no significance in students' engagement in the different degree programme across the semester. Also, Cakir and Saritepe (2015) looked into students' engagement and academic achievement using blended learning environment when compared to the face – to – face learning environment. However, there was no meaningful statistical difference detected for students' engagement between both groups.

From the reviewed literature, it can be observed that studies on effect of meta-cognitive strategies on academic achievement of students in various subjects dealt with the effect of one or at most two metacognitive strategies on achievement. Also, in the aspect of engagement, there are conflicting results on the effect of metacognitive strategies on engagement of students. Furthermore, strategies to ensure effective instructional delivery by teachers have often been emphasized with less attention paid on teaching students how to study to retain the good lessons delivered by teachers. As stated earlier, meta-cognitive strategies are set of skills that aid learners to become aware of how to study to learn effectively. This study therefore comparatively assessed the effect of explicit instruction, journal writing and question generation as metacognitive strategies on academic achievement and engagement of students in Mathematics in Abia State of Nigeria.

Specifically, the study sets to:

1. determine the effect of metacognitive strategies on academic achievement of students in Mathematics.
2. carry out pairwise comparison of achievement of students in each of the metacognitive groups and the control group.
3. determine the effect of metacognitive strategies on engagement of students in Mathematics.
4. carry out pairwise comparison of engagement of students in each of the

metacognitive groups and the control group.

Research Questions

1. What is the adjusted mathematics achievement mean scores of students who were exposed to explicit instruction, journal writing, question generation and conventional teaching strategies?
2. What is the adjusted mathematics engagement mean scores of students who were exposed to explicit instruction, journal writing, question generation and conventional teaching strategies?

Hypotheses

1. There is no significant difference in the mathematics achievement mean scores of students who are exposed to explicit instruction, journal writing, question generation and conventional teaching strategies.
2. The difference between the mathematics achievement mean scores in each of the pairwise comparisons of metacognitive groups and control group is not significant.
3. There is no significant difference in the mathematics engagement mean scores of students exposed to explicit instruction, journal writing, question generation and conventional teaching strategies.
4. The difference between the mathematics engagement mean scores in each of the pairwise comparison of metacognitive groups and control group is not significant.

Methodology

The study adopted a pretest posttest quasi- experimental research design. Four (4) intact classes of SS2 students from Michael Okpara University of Agriculture demonstration secondary school in Abia State, Nigeria participated in the experiment. The intact classes were randomly assigned to experimental and control groups. The number of students in each of the classes ranged from 26 to 30. However, twenty-five (25) students from each of the classes were randomly selected and used for analyses. Hence the sample size for the study is 100 students. The period of the experiment is 8 weeks in first term of 2019/2020 academic session.

One of the research instruments used for data collection was 40 item Mathematics Achievement Test developed by the researcher. Each correct response attracts

Method	Adjusted Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	75.949 ^a	1.456	73.058	78.840
2	65.844 ^a	1.456	62.954	68.735
3	78.728 ^a	1.456	75.837	81.619
4	43.639 ^a	1.457	40.746	46.531

a. Covariates appearing in the model are evaluated at the following values: PreAch = 37.80.

From table 1, the adjusted mean of group 3 (question generation) 78.728 is the highest, followed by group 1 (explicit instruction) 75.949, then group 2 (journal writing) 65.844 and lastly the control group (conventional teaching strategy) 43.639. Hence the adjusted mean scores of all the experimental groups are higher than that of control group. This suggests that the metacognitive strategies enhanced achievement of students in mathematics more than the conventional teaching strategy.

Hypothesis 1: There is no significant difference in the mathematics achievement mean scores of students who are exposed to explicit instruction, journal writing, question generation and conventional teaching strategies.

Table 2: ANCOVA of Achievement of experimental and control groups. Dependent Variable: PostAch

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	26661.906 ^a	4	6665.477	125.790	.000
Intercept	23850.625	1	23850.625	450.107	.000
PreAch	8801.586	1	8801.586	166.103	.000
Method	18986.222	3	6328.741	119.435	.000
Error	5033.934	95	52.989		
Total	467824.000	100			
Corrected Total	31695.840	99			

a. R Squared = .841 (Adjusted R Squared = .834)

Result show that f-value (119.435) is significant at 5% since the obtained p-value .000 is lower than the significance level of .05. Thus, the null hypothesis which states that there are no significant differences in the academic achievement in Mathematics among the groups is rejected. The implication is that the difference among the adjusted means of the experimental and control groups is significant. Hence the use of metacognitive strategies gave more significant improvement in students' academic achievement than the use of conventional teaching strategy. Further analysis of post hoc pairwise comparison of groups was conducted to show the source of the difference.

Hypothesis 2: The difference between the mathematics achievement mean scores in each of the pairwise comparisons of meta-cognitive groups and control group is not significant.

Table 3; Summary of Pairwise Comparison of Achievement of Groups

Group	F value	Sig
1 v 2	24.078	.000
1 V 3	1.822	.180
1 V 4	245.840	.000
2 V 3	39.148	.000
2 V 4	116.260	.000
3 V 4	290.078	.000

From table 3, result shows that the difference between the means of each of the experimental groups and control group is statistically significant since F – values for group 1 and 4; 2 and 4; 3 and 4 are all significant at 0.000. Also, significant difference is found between experimental groups, 1 and 2, and 2 and 3 whose significant levels are .000 each. However, the difference between experimental group 1 and 3 is not statistically significant because the F – value of 1.822 has a significant value of .180 (>0.05). The implication of these results is that achievement in each of the experimental groups is significantly better than that of the control group. The achievement in group 1 and 3 (which is not significantly different) is significantly better than achievement in group 2. This is evident from the results of the adjusted mean scores of the groups shown in table 1 where the adjusted mean scores of explicit, journal, question generation and conventional groups are 75.949, 65.844, 78.728 and 43.639 respectively.

Research question II: What is the adjusted mathematics engagement mean scores of students who were exposed to explicit instruction, journal writing, question generation and conventional teaching strategies?

Table 4: Adjusted Engagement mean scores of experimental and control groups.
Dependent Variable: PostEng

Method	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	2.990 ^a	.082	2.827	3.153
2	2.879 ^a	.082	2.716	3.041
3	3.195 ^a	.082	3.032	3.358
4	1.841^a	.082	1.679	2.004

a. Covariates appearing in the model are evaluated at the following values: PreEng = 1.793462.

From table 4, the adjusted engagement means of group 3 (question generation) 3.195 is the highest, followed by group 1 (explicit instruction) 2.990, then group 2 (journal writing) 2.879 and lastly the control group (conventional teaching strategy) 1.841. Hence the adjusted engagement mean scores of all the experimental groups are higher than that of control group. This suggests that the metacognitive strategies enhanced engagement of students in mathematics more than the conventional teaching strategy.

Hypothesis 3: There is no significant difference in the mathematics engagement mean scores of students exposed to explicit instruction, journal writing, question generation and conventional teaching strategies.

Table 5: Analysis of Covariance of mathematics Engagement of Experimental and Control groups Tests of Between-Subjects Effects Dependent Variable: PostEng

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	42.646 ^a	4	10.661	63.427	.000
Intercept	13.471	1	13.471	80.141	.000
PreEng	13.844	1	13.844	82.362	.000
Method	27.354	3	9.118	54.246	.000
Error	15.968	95	.168		
Total	801.873	100			
Corrected Total	58.614	99			

a. R Squared = .728 (Adjusted R Squared = .716)

Result from table 5 shows that f-value 54.246 is significant at 0.05 level of significance as the P-value (.000) is less than the significance level of 0.05. Thus, the null hypothesis is rejected. The implication is that the differences among the mathematics engagement of experimental and control groups are significant in favor of the experimental groups which had higher adjusted mean scores. Hence exposure to metacognitive strategies enhanced engagement of students in mathematics. Further analysis of post hoc pairwise comparison of groups was done to show the source of the difference.

Hypothesis 4: The difference between the mathematics engagement mean scores in each of the pairwise comparison of metacognitive groups and control group is not significant.

Table 6: Pairwise Comparison of Engagement of Groups

Group	F value	Sig
1 v 2	.925	.338
1 V 3	3.124	.080
1 V 4	98.070	.000
2 V 3	7.451	.008
2 V 4	79.880	.000
3 V 4	136.133	.000

Source: Extract from analyses of pairwise comparison of groups

The result of the analysis shows that the mean engagement in each of the experimental groups 1, 2 and 3 differ significantly with the mean engagement of group 4 at 0.05 significant levels, since the significant levels of 1 and 4; 2 and 4; 3 and 4 are 0.000 each. Also, significant difference exists between experimental group 2 and 3 whose significant level is .008 (less than .05). However, no significant difference exists between experimental groups 1 and 2; 1 and 3 whose significant levels are .338 and 0.80

respectively (greater than .05). Hence, the question generation, explicit instruction and journal writing metacognitive strategies enhanced the engagement of students in mathematics in that order. This is evident in the adjusted mean engagement scores shown in table 4 where the mean engagement of question generation, explicit instruction, journal writing and conventional teaching strategies are 3.195, 2.990, 2.879 and 1.841 respectively.

Discussion

Result of analyses presented on tables 1, 2 and 3 show that students exposed to meta-cognitive strategies (explicit instruction, journal writing and question generation) outperformed their counterparts exposed to conventional teaching strategy significantly. This indicates that meta-cognitive strategies are potent in enhancing academic achievement of students in mathematics. The fact that metacognitive strategies enhanced achievement of students in mathematics more than the conventional teaching strategy is in line with *a priori* expectation. The strategy of asking students to generate questions after instruction which emerged as the most potent meta-cognitive strategy has an inherent advantage or feature. The process of constructing test items and providing solutions to them (including plausible distracters in the case of multiple-choice items) enables students to scrutinize their course materials and think reflectively about the concept learnt. Also, question construction leads to review of instructional objectives and different components of the lesson (inherent in explicit instruction) to ensure that questions capture all the objectives of the lesson. Also, the process of constructing questions leads to development of writing skills as in the case of journal writing strategy. It is commonly believed that to know how to question well is to know how to learn well hence question construction and the other meta-cognitive strategies could lead to development of metacognitive skills.

The finding of this study is consistent with the result of the study by Gaylo and Dasles (2017) who reported better academic achievement of Grade 9 students who used think-aloud, journal writing as meta-cognitive strategies than their counterparts who used conventional teaching strategy. The result also corroborates the finding of Iwai (2016) who examined the impact of explicit instruction on reading strategies among 18 k-8 teacher candidates in a literacy methods course in the United States of America and found that the teacher candidates increased their awareness of meta-cognitive reading strategies after the intervention. It is also consistent with Aghai and Zhang (2012) who studied the impact of explicit teaching of reading strategies on English as a foreign language students' reading performance in Iran and reported that explicit teaching of reading strategies improved reading, comprehension, reading strategy and reading behavior s. The results of the study align with that of Mevarech and Amrany (2008) who investigated effects of meta-cognitive instruction on regulation of cognition and mathematics achievement and found that students exposed to meta-cognitive strategies out- performed their counterparts on mathematics achievement and regulation of cognition. Also, the finding of Safari and Meskini (2016) showed higher mean score of problem-solving skills in Health Sciences for students who used meta-cognitive instruction than those who used conventional teaching method. Similarly, Van de Kamp, *et al.* (2015) found that students exposed to explicit instruction performed better than students in control group in Visual Arts.

Furthermore, results of analyses presented on tables 4, 5 and 6 revealed that students who used meta-cognitive strategies (explicit instruction, journal writing and question generation) were more engaged in mathematics than those who used conventional teaching strategies. The reason for this result could be due to the fact that generating more illustrative examples in line with the objectives of the instruction as required in explicit instructional strategy, writing comprehensive report of the instructional activity as in journal writing and generating questions (both objective and essay) will expectedly demand more time from the students and thus will keep them more engaged than mere solving assignment questions as in the case of conventional teaching method.

The finding agrees with the result of previous studies by researchers. For instance, Ihendinihu and Eluwa (2019) explored the effect of students-generated questions on engagement time in mathematics learning and reported significant difference in the engagement time of students who were exposed to question generation and those who used conventional teaching strategy in favour of the experimental group. Also, Skilling (2013) reported that instructional strategies that directly addressed students' interests, values, competencies and self – efficacy were potent in promoting engagement in mathematics. Similarly, Gunuc (2014) reported high positive relationship between students' academic achievement and engagement in the cognitive, behavior al and emotional dimensions. Reyes, *et al* (2012) also reported higher achievement by students who were engaged in class than those who were not engaged.

However, the result of the present study is at variance with the finding of Hazewood (2015) who reported no significant difference with students' engagement due to the use of think –pair share metacognitive strategy and conventional teaching strategy. Also, Cakir and Saritepe (2015) found that there was no meaningful statistical difference detected for students' engagement when exposed to blended learning environment and the face – to – face learning environment.

Conclusion

Based on the findings of the study, the researcher concludes that explicit instruction, journal writing and question generation as meta-cognitive strategies led to improvement in academic achievement and engagement of students in mathematics more than the conventional learning strategy. Question generation emerged as the most potent metacognitive strategy in enhancing achievement and increasing students' engagement in mathematics.

Recommendations

Based on the conclusions drawn from the findings of the study, the following recommendations were made.

- ✓ Teachers should incorporate explicit instructional strategies in the teaching and learning of mathematics in secondary schools.
- ✓ Students could be asked to give a detailed written account of instructional activities and procedures, (including their difficulties and how they intend to handle them) to strengthen their cognitive skills.
- ✓ Students should be asked to generate questions (both objective and essay type) based on the topics learnt.
- ✓ Educational administrators should monitor the classroom teachers to ensure compliance of incorporating metacognitive instructional strategies while teaching mathematics.

- ✓ The Ministry of education needs to organize in-service training to enlighten mathematics teachers on how to apply these metacognitive strategies in the subject.
- ✓ Application of metacognitive strategies should be included in the curriculum of teacher trainees to expose them to proper use of metacognitive strategies during their training.

References

- Abeer, A. (2016). The effect of Explicit Instruction of Meta Cognitive Learning Strategies on Promoting Jordanian Language Learners; reading competence. *Journal Education and Practice*, 7(10), 170 – 177.
- Aghaie, R. & Zhang, L. J (2012). Effects of explicit instruction in cognitive and metacognitive reading strategies on Iranian EFL students' reading performance and strategy transfer. *Instructional Science*. 40 (6), 1063 – 1081.
- Agulanna, G. G. & Nwachukwu, F. J. (2014). *Psychology of Learning Putting theory into practice*. Owerri: Career Publishers.
- Archer, L. A. & Hughes, C. A. (2011). *Explicit Instruction: effective and efficient teaching*. The Guilford Press.
- Beach, R. N. & Friedrich, T. (2008). Response to writing. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds). *Handbook of writing research*. 222– 234. New York, NY: Guilford.
- Boud, D. (2001). Using Journal writing to enhance reflective practice. *New Directions for Adult and Continuing Education*, 2001 (90), 9 – 18, doi: 10.1002/ace.16
- Cakir, H. & Saritepeci, M. (2015). The effect of blended learning environments on student motivation and student engagement: A study on social studies course', *Education and Science*, 40(177), 203 – 216.
- Coates, H. B. (2008). Attracting, engaging and retaining: New conversations about learning. Australian student engagement report, *Australian Council for Educational Research* (ACER), Camberwell, Victoria.
- Cohn, J. D., & Stewart, M. (2016). Promoting metacognitive thought through response to low – stakes reflective writing. *Journal of Response to writing*, 2(1), 58 – 74. Retrieved from <http://www.journalrw.org/index.php/jrw/article/view/51>
- Farahian, M. (2015). Assessing EFL learners' writing metacognitive awareness. *Journal of Language and Linguistic Studies*, 11(2), 39 – 51.
- Federal Republic of Nigeria (FRN, 2013). *National Policy on Education*. Lagos: NERDC Press.

- Ganyaupfu, E. (2013). Teaching methods and student's academic performance, *International Journal of Humanities and Social Science Invention*, 2(9), 29–35.
- Gaylo, D. N. & Dales, Z. I. (2017). Metacognitive strategies: Their effects on Students' Academic Achievement and Engagement in Mathematics. *World Review of Business Research*, 7(2), 35-55
- Gourgey, A. F. (2003). *Teaching reading from a metacognitive perspective: Theory and classroom experience*. In N. A. Stahl & H. Boylan (Eds.), *Teaching developmental reading: Historical, theoretical, and practical background readings* (pp. 126 – 134). Boston, M. A: Bedford/St. Martin's.
- Gunuc, S. (2014): The relationship between student engagement and their academic achievement. *International Journal on New Trends in Education and Their Implications*, 5(4), 216–231
- Hacker, D. J., Keener, M. C. & Kircher, J. C. (2009). Writing is applied metacognition. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.) *Handbook of metacognition in education* (154–172). New York: Routledge.
- Hazelwood, Z. (2015). Maintaining student engagement in a multidisciplinary allied health communication skills course. *Students Transitions Achievement Retention & Success (STARS) Conference 2015 Handbook & Proceedings*, Melbourne: UniSTARS,
- Ibe, H. N. (2015). Effects of Learning Styles on the Performances of Senior Secondary School Biology Students. *International Association of African Researchers and Reviewers*, 9(1), 36-42.
- Ihendinihu, U. E. & Eluwa, I. O. (2019). Question Generation: A tool for Enhancing Engagement of Students in Mathematics. *Journal on Nigerian Academy of Education* 15(2), 159-171
- Iwai, Y. (2016). The Effect of Explicit Instruction on Strategic Reading in a Literacy Methods Course. *International Journal of Teaching and Learning*, 28(1), 110–118.
- Jaleel, S., & Premachandran, P. (2016). A study on the metacognitive Awareness of Secondary School Students. *Universal Journal of Educational Research*, 4(1), 165–172.
- Jayapraha, G. (2013). Metacognitive instruction and cooperative learning strategies in promoting insightful learning in science. *International Journal on New Trends in Education and Their Implications*, 4(1), 165–172.
- Kuh, G. D. (2009). What student affairs professionals need to know about student engagement, *Journal of College Student Development*, 50, (6), 683-706. Available on

at doi:10.1353/csd.0.0099.

- Lai, E. (2011). *Metacognition: A Literature Review*. Pearson's Research Reviews. Viewed 27 January. <http://moodle.elac.edu>
- Laverpool, A. (2008). The efficacy of rereading as a metacognitive tool for reading comprehension monitoring. *Journal of College Reading and Learning*, 38(2), 31 – 48.
- Little, E. M. & Delisio, L. (2015). Explicit Instruction in Mathematics. *Division for Learning Disabilities and Council for Exceptional Persons*, 1(23), 1 -5.
- Mair, C. (2012). Using technology for enhancing reflective writing, metacognition and learning. *Journal of Further and Higher Education*, 36(2), 147 – 167.
- Mansoor, F., Fakhri, H., & Alamdari, E. (2014). Exploring the effect of the model of metacognitive instruction on the listening performance of EFL learners. *International Journal of Research Studies in Language Learning*, 3(6), 3 – 20.
- Meibodi, M. K., Lakdizaji, S., Abdollahzadeh, F., Hassankhanh, H., Rahmani, A., & Lasater, K. (2013). Impact of guided reciprocal peer questioning on the deposition of critical thinking among nursing students. *Thrita Journal of Medical Science*, 2(3), 10 – 14.
- Mevarech, Z. R. & Amrany C. (2008). Effects of meta – cognitive instruction on regulation of cognition and mathematics achievement. *Journal of Educational Psychology*, 4(3), 147 – 157.
- Mok, M. M. C. (2005). *A conceptual framework for the design of web-based self-directed learning curriculum*. Keynote presented at the International Conference on Education and Information Technology, National Ocean University, Keelung, Taiwan.
- Negretti, R. (2012). Metacognition in student academic writing: A longitudinal study of metacognitive awareness and its relation to task perception, self – regulation, and evaluation of performance. *Written Communication*. 29(2), 142 – 179.
- Okwunalu, M. (2019). *Effect of Explicit Instruction Metacognitive Teaching on Students' Academic Achievement in Budiness*. An Unpublished Master Degree Thesis. Imo State University, Owerri.
- Orlich, D. C., Harder, R. J., Callahan, R. C., Trevisan, M. S. & Brown, A. H. (2010). *Teaching Strategies – Guide to Effective Instruction*. 9th Edition, Wadsworth Engage Learning.
- Pacello, J. (2014). Integrating metacognition into a developmental reading and writing

- course to promote skill transfer: AN examination of student perceptions and experiences. *Journal of College Reading and Learning*, 44(2) : 119 – 140.
- Reyes, M. Brackett, M. Rivers, S. White, M. & Salovey, P. (2012). Classroom emotional climate, students engagement and academic achievement. *Journal of Educational Psychology*, 104(3):700 – 712.
- Safari, Y., & Meskini, H. (2016). The effects of metacognitive instruction on problem solving skills in Iranian students of health sciences. *Global journal of health science*, 8(1) : 150-161.
- Sahin, S. & Kendir, F. (2013). The effects of using metacognitive strategies for solving geometry problems on students' achievement and attitude', *Educational Research and Reviews*. 8(19), 1777 – 1792.
- Skilling, K. (2013). *Factors that influence year 7 students' engagement and achievement in Mathematics*. PhD thesis, University of Sydney, Australia.
- Tarricone, P. (2011). *The taxonomy of metacognition*. New York: Psychology Press.
- Tavakoli, H., & Koosha, M. (2016). The Effect of Explicit Metacognitive Strategy Instruction on Reading Comprehension and Self – Efficacy Beliefs: The Case of Iranian University EFL Students. *Porta Linguarum*, 25(1), 119-133.
- Van de Kamp, M. T., Admiraal, W., van Drie, J., & Rijlaarsdam, G. (2015). Enhancing divergent thinking in visual arts education: Effects of explicit instruction of metacognition. *British Journal of Educational Psychology*, 85(1), 47 – 58.
- Wanner, T. (2015). Enhancing student engagement and active learning through just- in-time teaching and the use of power point, *International Journal of Teaching and Learning in Higher Education*, 27(1), 154-163.
- Wong, K. Y. (2012). Use of Student Mathematics Questioning to promote Active Learning and Metacognition. *12th International Congress on Mathematics Education (ICME – 12)*, Seoul, Korea, 8 – 15 July, 2012.

**A SURVEY OF TEACHERS' USE OF PORTFOLIO ASSESSMENT IN
PRIVATE NURSERY SCHOOLS IN JOS METROPOLIS, PLATEAU STATE,
NIGERIA**

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Abstract

The study surveyed private nursery school teachers' use of portfolio assessment in monitoring learning and development of young children in Jos Metropolis. This was done to find out whether the teachers are utilizing the benefits of portfolio to obtain holistic picture of pupils in order to adequately cater for their learning and developmental needs. In doing this, the extent to which teachers keep portfolio and the content of the portfolio kept by them were investigated. Six research questions were formulated for the study which adopted a descriptive survey design. The population of the study comprised all private nursery school teachers in Jos Metropolis. One hundred and twenty teachers from 60 randomly selected private nursery schools formed the sample for the study. A portfolio assessment checklist developed by the researchers was used for data collection. The content validity of the instrument was judged adequate by two experts from Early Childhood and Educational Measurement Units respectively. The coefficient of stability of the instrument was found to be 0.86. Data were analyzed using frequency counts and percentages while results were presented using tables and charts. The findings of the study showed that 60% of the teachers sampled keep portfolios for their pupils while 40% do not. Findings on the extent teachers' qualifications, years of experience and class size influence teachers' keeping of portfolios showed no particular trend. However, female teachers were found to keep portfolios more than the males. Portfolio components commonly kept by teachers included: academic records, samples of writing and art works. The least kept portfolio components were video tapes of large projects, tapes of reading, dictation and interviews. It was concluded that nursery school teachers in private schools do not adequately use portfolio assessment. Regular training on keeping of portfolios and regular monitoring were recommended for private nursery school teachers.

Key Words: Portfolio, Assessment, Private Nursery Schools, Jos Metropolis

Introduction

Nursery School children (age 3-5years) are at the critical stage of their development. At this early childhood age even up to 8 years, children develop rapidly but the speed varies between children and domains. While one child is developing fast in social interaction for example, he/she may be developing slowly in manipulative skills. As a result of this variability, the teacher needs to apply developmentally appropriate methods in teaching the young children as the practice adopted in their education is critical to their

learning and development. Such practices should include current and effective approaches to learning and development, informed by what is known from theory and literature about how children develop and learn (National Association for the Development of Young Children (NAEYC, 2009). In order to monitor children's learning and development, make decisions that inform curriculum planning for individual and group experiences, the early childhood teacher needs to gather information through assessment. What is known about each child through assessment helps the teacher attend to each child as an individual. Assessment practices adopted for young children therefore, need to be developmentally appropriate. In a changing world of today, assessment has departed from just testing to providing a holistic picture of a child through use of authentic assessment methods and portfolio is one of such methods.

Developmentally appropriate methods used for teaching children focus on how they learn best. This requires teachers to meet the children where they are and help them get to where they should be, considering the development of the total child (Morgan, 2010). This entails using the information gathered about the children to create suitable programmes for the age and stage of development of the children, the programme at the same time considers the needs of individual child (Child Care Awareness, 2016). Children learn best in an environment that provides them with responsive relationship with adults, hands-on activities, meaningful experiences and opportunities to constant understanding of the world. Therefore, teaching of young children takes place in a variety of format and is integrated into every aspect of the environment. This helps the teacher use variety of teaching strategies, large group, small group, play, engagement in the classroom and daily routine to provide opportunities for teaching, learning and discovering thus promoting the health of the whole child (Morgan, 2010). The teacher is therefore always busy observing children as they learn and interact with others as well as their environment, documenting their interests, abilities and developmental progress (NAEYC, 2009). The information gathered during such times, make up the assessment records.

The purposes for assessment of young children include diagnosis in order to identify potential problems in development, reveal strength, areas of need as well as nature and severity of the need. The purpose could also be instructional in order to collect information for supporting and monitoring learning by providing feedback on teaching and learning effectiveness. This type of assessment addresses areas like physical, motor, socio-emotional domain, approaches to learning, languages and communication as well as cognitive general knowledge. Assessment can also be done for program evaluation. The procedure used for data collection should always match the purpose (Washington State Office of Superintendent of Public Instruction (WSOSPI), 2008).

In planning assessment, Jiban (2013) suggests that the tools be aligned to; domains of instruction or intervention, assessment purpose and methods. He posits that scores from assessment of young children tend to be unstable given that they grow and learn at remarkable and unpredictable rates. As a result of this, one-shot assessment is not meaningful for them. Best practices for assessment of young children according to Southern Early Childhood Association (SECA) (n.d.) should include careful selection of strategies that measure specific characteristics, over several stipulated periods of time and

in many different contexts, in order to provide a holistic picture of each child's growth, development and learning. The strategies can include formal tests which maybe achievement, diagnostic, developmental, intelligence and readiness or informal methods like observational and work sample techniques. Given the complexity and dynamic nature of assessment of young children, authentic assessment using combination of methods and sources of information is recommended (WSOSPI, 2008; Willis, 2016).

Authentic assessment entails systematic observation, documentation and analysis. It helps track a child's progress towards meeting early learning expectations and is also a good aid for teacher's curriculum planning and instruction. It is formative in nature and entails documentation and analysis of a child's actual work collected over time in his/her real-world environment. Authentic assessment helps children to relate what is taught to the real world in which they live. It captures how a child uses his/her skills while interacting with teachers, parents, peers, materials and documents, unobtrusively. The procedure entails teacher observing, collecting data over time, selecting and organizing evidences in form of portfolio, preparing curriculum and sharing conclusions with parents and others. Portfolio assessment with children's work samples and other evidences from several sources, collected unobtrusively during real world activities are recommended for documentation of children's efforts, interests, progress and achievement in specific areas (Illinois State Board of Education (ISBE), 2012).

One authentic assessment method that helps the teacher take a holistic look at a child during decisions making is portfolio method. Portfolio helps the teacher discover what students think, how they think, what they value and who they are. A portfolio is a collection of a child's work that exhibits the child's efforts, progress and achievement in different areas. The collection is guided by established purpose, it involves a child's participation in selecting items to be included in the collection and criteria for judging the merit and self-reflection. Portfolio focuses on authentic performance by including all kinds of evidences of learning from different sources at different times. It is said to be the most comprehensive tool for documenting children's growth, efforts and achievements (Martin-Knied, 2000).

Portfolio assessment is a practical method for measuring and interpreting children's performance relative to the set instructional objectives. The process is individualized and reveals each child's unique needs and strength. In portfolio assessment, children and teachers make decisions on samples to be included in the portfolio, teachers and parents can review portfolio, exchange observations, make suggestions about activities in the home and school that will enhance the child's development. These help teachers, children and parents to work collaboratively (ISBE, 2012; Ngatia & Mugailwo, 2014). The use of portfolio assessment thus helps children develop intimate and lasting relationship with their teachers and this helps to improve learning. The components of a child's portfolio include work samples, records of various forms of systematic observations and screening tests (Willis, 2016).

Although ISBE (2012) posits that professional development and years of experience are essential elements of authentic assessment methods to which portfolio

belongs, research findings are not consistent on these issues with regard to teachers' use of portfolio assessment. While Ngatia and Mugailwo (2014) found that the higher the teachers' qualification, the less likely it is that they use portfolio, Ali (2014) found no significant difference in prospective teachers' attitude towards use of portfolio based on their qualification. The findings of the former might be as a result of the fact that the Primary Teacher Certificate holders in their study who use portfolio more than the higher degree holders, were deliberately trained to teach young children. Again, teachers who have taught for longer period of time ought to use portfolio assessment more as a result of their years of experience in teaching but Ngatia and Mugailwo found teachers' years of experience to have no influence on their use of portfolio.

The implication of teachers' use of portfolio assessment is that portfolio be kept by them for each child. This involves careful and meticulous documentations of observations of children in different contexts. Who is more likely to painstakingly do this assignment, the male or female teachers? Bryant and Timmins (n.d.) opine that gender differences exist in teachers' use of portfolio and Ali (2014) confirms same by stating that female prospective teachers have more positive attitude towards the use of portfolio than males.

Class size may also influence teachers' use of portfolio because it requires a lot of time. Small class size and improvement of teacher-pupil ratio make for quality student-teacher interaction and afford teacher better class control and engagement of students, (James, 2006; Willis, 2016). This may have informed the recommendation in the National Policy on Education that the ratio of teacher to children be put at 1: 25 (FRN, 2013).

Given the proliferation of private schools in Plateau State as the private sector strives to partner with the government in the development of education, it is necessary to ensure that appropriate practices are adopted especially in the education of young children. Since information gathered with portfolio helps teacher track each child's progress, monitoring of his/her learning and development is thus made possible and effective. This is very important because if anything goes wrong at the foundation stage, devastating effects are experienced in later life. The study therefore surveyed the extent to which private nursery school teachers use portfolio assessment by investigating the extent to which they keep portfolios and the common components of portfolios kept by them. It also investigated the extent to which teachers' qualifications, years of experience, gender and the size of class taught, influence teachers' keeping of portfolios.

The following research questions guided the study:

1. To what extent do private nursery school teachers keep pupils' portfolios?
2. To what extent do private nursery school teachers' educational qualifications influence their keeping of portfolios?
3. To what extent do private nursery school teachers' years of experience influence their keeping of portfolios?
4. To what extent does gender influence private nursery school teachers' keeping of portfolios?
5. To what extent does class size influence private nursery school teachers' keeping of portfolios?

6. What are the common components of portfolios kept by private nursery school teachers in the study area?

Methodology

The study adopted a descriptive survey design and all the private nursery school teachers in Jos Metropolis made up the population for the study. Sixty private nursery schools were randomly sampled from the population while 120 teachers, two per school were randomly sampled for the study. A portfolio assessment checklist developed by the researchers was used for data collection. The instrument was structured to elicit information on teachers' qualification, years of experience, gender and the size of the class they teach. The presence or absence of portfolios as well as their common components were also sought. The content validity of the instrument was judged adequate by an early childhood expert and an educational measurement expert from the University of Jos. The instrument was tried out on twenty private nursery school teachers not involved in the study and its measure of stability was found to be 0.86 using test-retest method. Data collected were analyzed using frequency counts and percentages while tables and charts were used for presentation of results.

Results

Research Question 1: To what extent do private nursery school teachers keep pupils' portfolios?

Table 1: Teachers' Extent of Keeping Portfolios

Status	Number of Teachers	Percentage (%)
Portfolio Present	72	60
Portfolio Absent	48	40

Table 1 shows that only 60% of teachers keep portfolio which is about average.

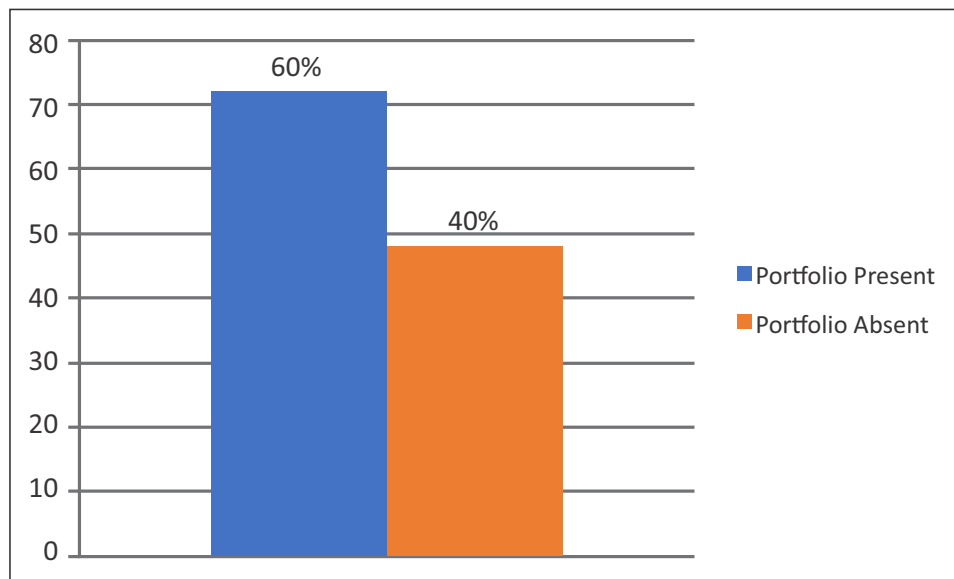


Figure 1. Bar Chart of Number of Teachers Keeping and not Keeping Portfolios.

Research Question 2: To what extent do private nursery school teachers' educational qualifications influence their keeping of portfolios?

Table 2: Extent of Teachers' Keeping of Portfolios according to their Qualifications

Qualification	No. Teachers	No. Keeping	No.	Not
Keeping NCE	81	52 (64.2%)	29	(35.8%)
B.ED/ BSc/BA	33	15 (45.5%)	18	(54.5%)
M.Ed and Above	6	6 (100%)	0	(0%)

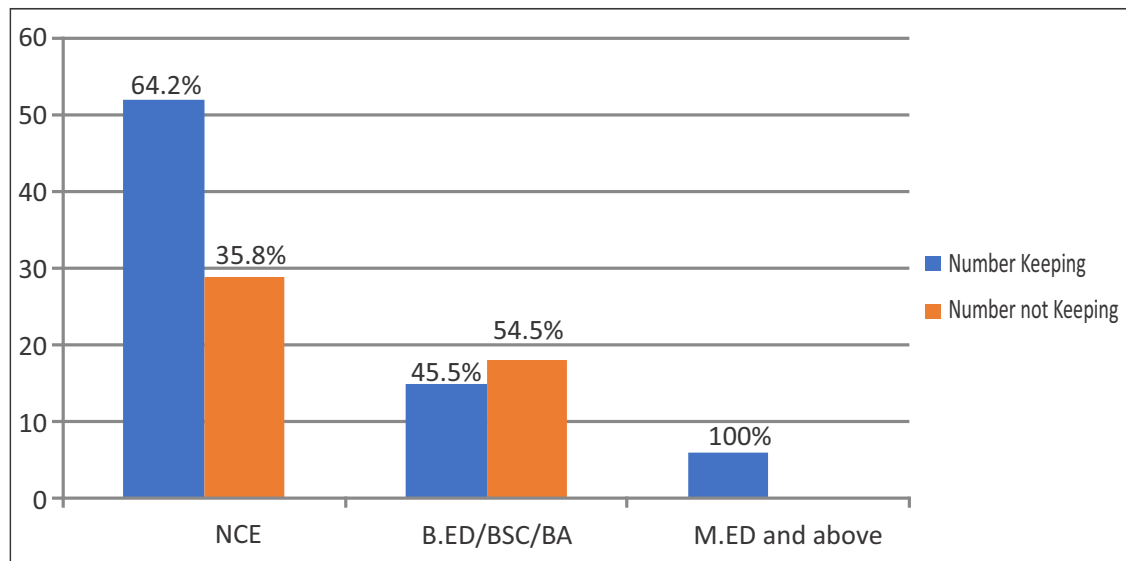


Figure2. Bar Chart Showing Teachers' Extent of Portfolio Keeping according to Educational Qualifications.

Table 2 shows 100% of teachers with M.ED and above involved in the study keep portfolios, followed by 64.2% of NCE holders while only 45.5% of first degree holders in the study keep portfolios. The result does not reveal any particular trend either the higher the qualification, the more teachers keep portfolios or vice versa.

Research Question 3: To what extent do private nursery school teachers' years of experience influence their keeping of portfolios?

Table 3: Extent of Teachers' Keeping of Portfolios According to their Years of Experience

Years of Experience	Number of Teachers	Number Keeping	Number not keeping
0 – 5	48	28 (59.6%)	19 (40.4%)
6 – 10	38	24 (63.2%)	14 (36.8%)
11 and above	34	20 (58.8%)	14 (41.2%)

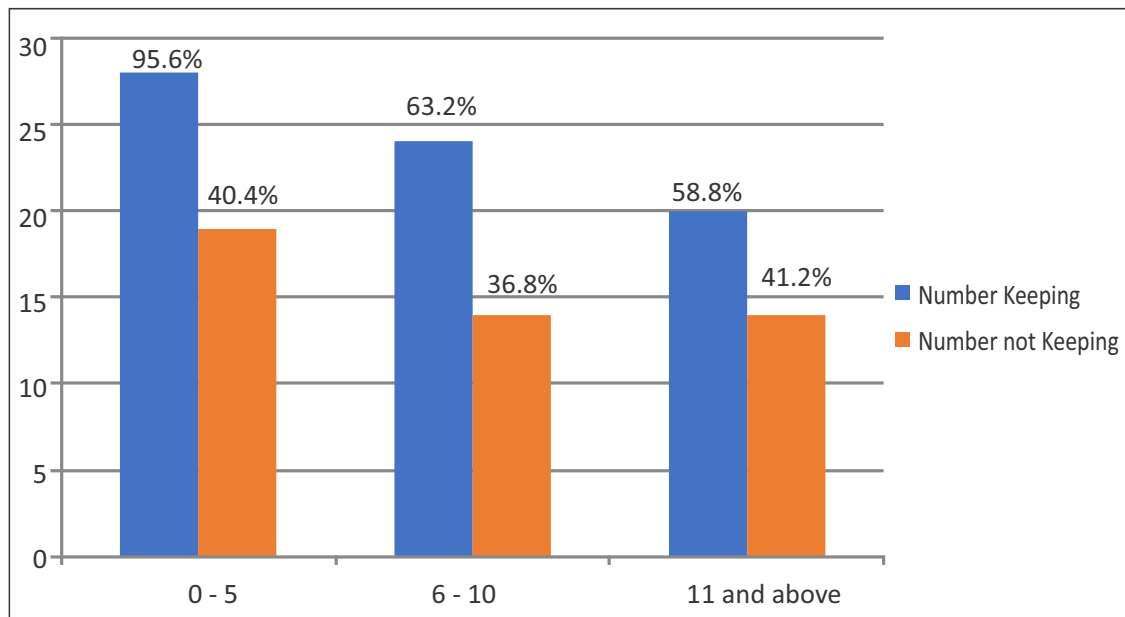


Figure 3. Extent of Teachers' Keeping of Portfolios according to Years of Teaching Experience.

Table 3 shows the more experienced teachers (11 years and above) to be least keepers of portfolios, followed by 0-5 years and then teachers with 6-10 years of experience. No particular trend is equally revealed.

Research Question 4: To what extent does gender influence private nursery school teachers' keeping of portfolios?

Table 4: Extent to Which Teachers Keep Portfolios Based on Their Gender

Gender	Number of Teachers	Number keeping	Number not keeping
Male	13	4 (36.4%)	9 (63.6%)
Female	107	69 (64.5%)	38 (35.5%)

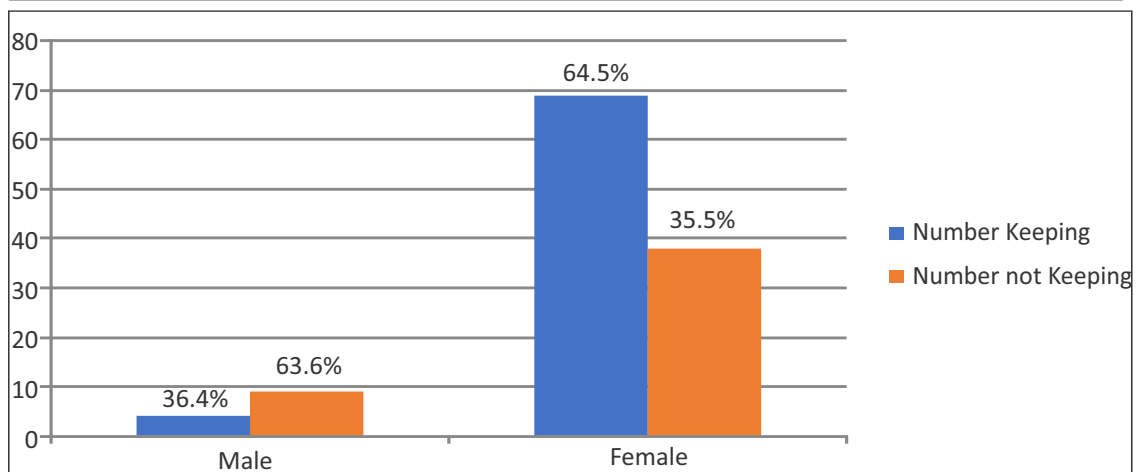


Figure 4. Bar Chart Showing Extent of Teachers' Keeping of Portfolios according to Gender.

Table 4 shows that female teachers keep portfolios more than males.

Research Question 5: To what extent does class size influence private nursery school teachers' keeping of portfolios?

Table 5: Extent to Which Teachers Keep Portfolios Based on Their Class Size

Class Size	Number of Teachers	Number keeping	Number not keeping
1 – 15	49	24 (49.0%)	25 (51.0%)
16 – 30	56	40 (71.4%)	16 (28.6%)
31 and above	15	9 (60.0%)	6 (40.0%)

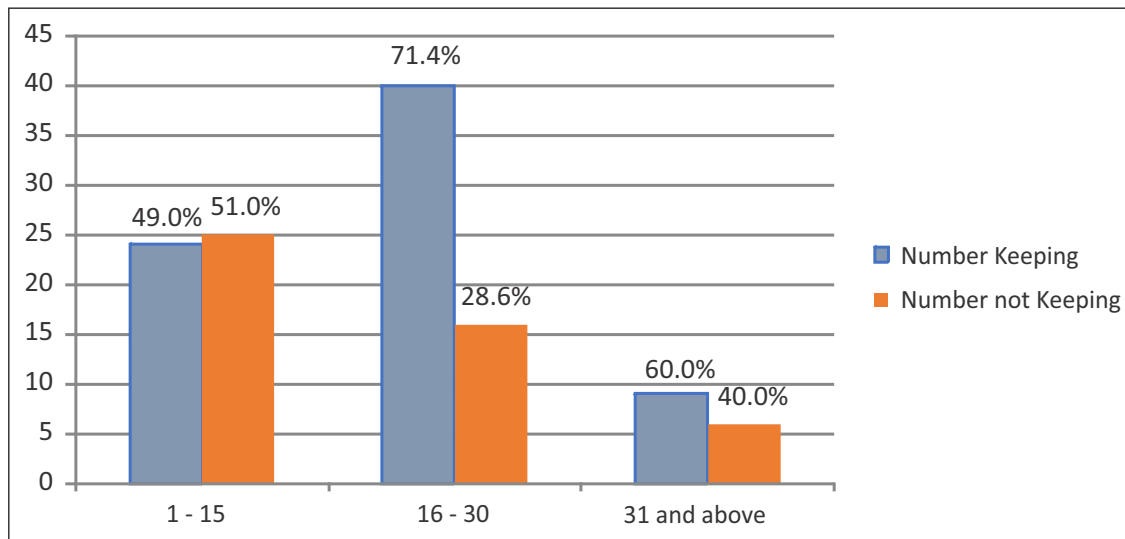


Figure 5. Bar Chart Showing Teachers' Extent of Keeping of Portfolios according to Class Size.

Table 5 shows the teachers that teach more children keep portfolios more than those who teach fewer children although no particular trend is followed.

Research Question 6: What are the common components of portfolios kept by private nursery school teachers in the study area?

Table 6: Ranking of Portfolio Components Kept by Teachers

Portfolio Component	Number of Teachers	Percentage	Rank
Academic Records	70	97.2	1 st
Samples of Writing exercises	69	95.8	2 nd
Samples of drawing, painting and other art work	68	94.4	3 rd
Health/Wellbeing examination Records	62	86.1	4 th
Parents/ Caregivers Notes	61	84.7	5 th
Language Samples	59	81.9	6 th
Records of Socio-emotional ratings	56	77.8	7 th
Records of manipulative/Muscular dev.	53	73.6	8 th
Logs of books read	49	68.1	9 th
Anecdotal records	46	63.9	10 th
Samples of cultural artifacts	39	54.2	11 th
Videos/ Photographs of large projects	30	41.7	12 th
Tape records of reading/dictation	18	25	13 th
Tape records of interview	13	18.1	14 th

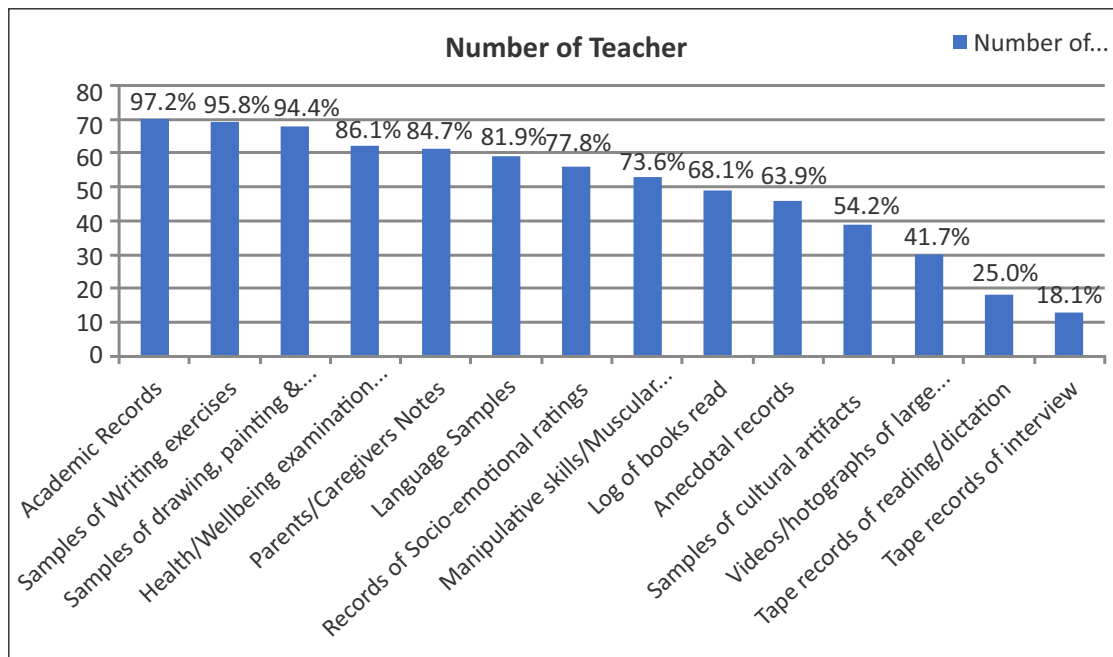


Figure 6. Bar Chart of Number of Teachers Keeping the Various Portfolio Contents

Table 6 shows academic records, writings, paintings and artwork, health, Parent/Caregivers' reports, language samples and socio-emotional ratings as the commonly kept portfolio components. The least kept are: interview records, reading and dictation tape records as well as photographs of large projects.

Discussion of Findings

The findings of the study showed that private nursery school teachers do not adequately use portfolios for assessment of pupils in their schools. This is unexpected given that private schools have been running programmes on early childhood education for quite some time. They ought to have discovered the paradigm shift from mere testing to keeping of portfolios in order to have a holistic picture of the children for the purpose of adequate monitoring of their learning and development. This finding makes it difficult to say that the learning and development of nursery school pupils in the study area are adequately monitored, so potential learning and developmental problems may not be detected early enough for proper and timely intervention. This may then defeat one of the major purposes for assessment in early childhood.

Teachers' level of educational qualification appeared not to have a defined influence on teachers' keeping of portfolios. This is contrary to the position of ISBE (2012) that professional training makes for greater use of portfolio assessment. This finding tilts more towards the finding of Ngatia and Mugailwo (2014) that teachers' educational qualification has no effect on their use of portfolios. This was also supported by Ali (2014) who found no significant difference in the attitude of prospective teachers towards use of portfolios as a result of educational qualification. The teachers in the area of study are more of NCE holders as this is the minimum qualification for teaching in primary schools. A reasonable number of these professionals specially trained to teach young children do not keep portfolios and so do not use them for assessment. This ought not so to be so the teachers need training on keeping of portfolios.

Teachers' years of experience in the study showed no particular trend in its influence on teachers keeping of portfolios. This is contrary to the position of ISBE (2012) that it does and that the more experienced the teachers are the more they use portfolios. The finding of Ngatia and Mugailwo (2014) however, is that there is no influence of teachers' years of experience on the use of portfolios. For the teachers in the study area, no trend is noticed in the influence of teachers' years of experience on their keeping of portfolios.

The influence of gender on teachers' keeping of portfolios was found to be in favor of female teachers. This confirms the position of Ali (2014) that females have more positive attitude towards the use of portfolios. Bryant and Tammin (n.d.) also posit that gender differences exist in the use of portfolios. It could be as a result of the fact that teaching at early childhood level is dominated by females in the study area. Again going by the painstaking and meticulous nature of portfolio assessment, it is expected that female teachers who are likely to be more patient and interested in details should do better at keeping portfolios.

The findings on influence of class size on teachers keeping of portfolios, showed

no particular trend contrary to expectations. James (2006) and Willis (2016) opine that improving teacher-pupil ratio, using smaller class size favor student engagement and student-teacher relationships which are requirements for use of portfolios. The class teachers with the least number of children (1-15) in the study however, were the least in keeping of portfolios.

Academic records, writing samples, draws and paints which teachers are used to, were the major components of portfolios kept by teachers. However, other observation records like health and wellbeing, parents/caregivers' records, socio-emotional ratings and manipulative skills records were also kept to some extent in line with the position of Willis (2016). The least kept components were interview records, photographs of large projects, reading and dictation records, may be due to unavailability of the equipment required for gathering and documenting such information.

Conclusion

From the findings of the study, it can be concluded that private nursery school teachers do not adequately make use of portfolio assessment since many of them do not keep portfolios. The female teachers however use portfolio assessment more than the males going by the fact that the percentage of females that keep portfolios is more than that of the males. Teachers' educational qualification, years of experience and size of class taught were not found to influence teachers' keeping of portfolios in the study area as no particular trend was seen.

Recommendations

Based on the findings, the following were recommended:

1. Regular training and retraining of teachers on how to keep and use portfolios for assessment in nursery schools.
2. Regular monitoring of nursery schools to ensure teachers are using appropriate assessment methods.

References

- Ali, I. (2014). Prospective teachers' attitude towards the use of portfolio. *Journal of Education and Practice*, 5(26). ISSN 2222-288X (online)
- [Bryant, S.L. & Timmins, A.A. \(n.d.\). Using portfolio assessment and innovation to assess problem-based learning in Hong Kong schools. Retrieved from www.tp.edu.sg/files/centres/pbl](http://www.tp.edu.sg/files/centres/pbl)
- Child Care Awareness (2016). *Developmentally appropriate practices*. Retrieved from childcareawareness.org/child-care-providers/programmeplanning/developmentally-appropriate-practices.
- Federal Republic of Nigeria (2013). *National Policy on Education*. Lagos: NERDC Press.
- Illinois State Board of Education (2012). *Authentic assessment and early childhood education - an update and resource*. Retrieved from ec.thecentreweb.org/.../lp_spring-twelve_1-6.

- James, S.K. (2006). The influence of class size research on state and local education policy: Brookings Papers on Educational Policy Conference, 22nd – 23rd May, 2006.
- Jiban, C. (2013). *Early childhood assessment: implementing effective practice*. Retrieved from www.nwea.org/upload/2014/07
- Morgan, A. (2010). *What does it mean to use developmentally appropriate practice?* Retrieved from www.notjustcute.com/2010/11/15/dap-what-does-it-mean-to-use-developmentally-appropriate-practice/
- Martin-Kneid, G.O. (2000). *Becoming a better teacher: Eight innovations that work*. Virginia, USA: Association for Supervision and Curriculum Development
- National Association for the Education of Young Children (2009). *Developmentally appropriate practice in early childhood programmes serving children from birth through page 8*. Retrieved from www.naeyc.org/files/.../PSDAP.pdf
- Ngatia, A.W. & Mugailwo, E. (2014). Portfolio Assessment: Transforming classroom assessment for quality learning in lower primary classes, Kiambu County, Kenya. Paper presented at the 40th International Association for Educational Assessment (IAEA) Conference, Grand Copthorne Waterfront, Singapore, 25th – 30th May.
- Southern Early Childhood Association (n.d). *Assessing development and learning in young children*. Retrieved from www.southernearlychildhood.org
- Washington State Office of Superintendent of Public Instruction (2008). *A guide to assessment in early childhood: infancy to age 8*. Retrieved from www.k12.wa.us/EarlyLearning.
- Willis, S. (2016). *Educators seek developmentally appropriateness*. Retrieved from www.ascd.org.

TEACHERS' CLASSROOM MANAGEMENT: BEHAVIORAL AND INSTRUCTIONAL MANAGEMENT STYLES AND CLASSROOM CONTROL BELIEFS

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Abstract

The study investigated Osun State secondary school teachers' classroom management styles alongside the behavioral and instructional management styles. The study examined the nature of classroom management approaches of the teacher-behavior versus Instructional management styles. It further determined teachers' control beliefs on the two approaches of management styles as well as the influence of teaching experience on their beliefs. The study adopted a survey design. The population of the study comprised all the senior secondary school teachers in Osun State, Nigeria. The sample size comprised 205 senior secondary school teachers selected across Osun Central senatorial districts in the State using a simple random sampling technique. Behavior and Instructional Management Scale (BIMS) developed by Martin and Sass (2010) was slightly adapted and used for the study. Percentages, mean, t-test and Chi-square were used to analyze the data. The results showed that teachers significantly utilized behavioral classroom management style than instructional management style. Also, teachers' classroom control beliefs are more of interventionist than non-interventionist in both behavioral and instructional management styles. Teaching experience had a significant influence on teachers' classroom control beliefs only in behavioral management approach, $\chi^2(n=205)=19.93, df=4, p<.05$. The study therefore concludes that teachers' classroom management style is behavioral in approach with teacher-centered rather than student-centered in orientation. The study recommends a complete paradigm shift in teaching beliefs from traditional teacher-centered to modern day student-centered approach.

Key words: Teachers, behavioral, instructional, management, beliefs,

Introduction

One of the ultimate goals of classroom interactions is to bring about effective and enduring change in behavior of learners. This expected change in behavior is not only limited to change in cognitive capability but also include positive change in affective and psychomotor domains. While learners are the center of attention in the classroom interactions, teachers are the managers (Marzano, Marzano, & Pickering, 2003; Emmer, Evertson & Worham, 2006; Sabanci & Özyildirim, 2020) and the quality of product expected from classroom interactions is a function of how skillful and effective are the teachers in their management styles. Classroom interactions are combination of series of activities which include learning, social interaction and student behavior (Martin & Baldwin, 1998) and teachers have to oversee these activities in a productive manner. In

other words, classroom has to be well-managed such that the overall goals of interactions are not jeopardized. Teaching and learning can only flourish when the classrooms are well-managed (Marzano, 2003).

Classroom management is described as the methods and strategies an educator puts in place to create and maintain a classroom environment conducive for student success and learning (McCreary, 2010). According to McCreary (2010), managing classroom for effectiveness can be achieved through different pedagogical strategies, nonetheless, the bottom line is for classroom learning environment communicate the assurance of both psychological and physical safety for student to learn. Of importance concern for teachers is classroom management because it is seen as a powerful component of the overall classroom climate that impacts on the degree of students' engagement, the frequency of inappropriate behavior and the quality of learning (Martin & Sass, 2010). Teachers' orientation, personality, attitudes and beliefs system also play a major role in teachers' strategies for coping with daily professional challenges, general well-being, shape students' learning environment and as well influence student motivation and achievement (Organisation for Economic Co-operation and Development-OECD, 2009).

Several studies (Erden & Wolfgang, 2004; Martin & Sass, 2010; Egeberg, McConney, & Price, 2016) have documented that personal set of attitudes and beliefs system about how children develop tends to influence teachers-students' interactions. Study also found that teacher's belief systems on child development perspective translate to their expectations for both learning and behavior and irrespective of whether teachers are consciously aware of them or not, are significant determinant factors of teachers-students' interactions (Sass, Lopes, Oliveira & Martin, 2016). In other words, if this empirically supported assertion is anything to go by, teachers' objectives and approach towards classroom management can also depend on the theoretical perspectives through which their students are viewed (Egeberg, McConney, & Price, 2016). According to Burden (2017) it is the responsibility of an effective classroom manager to determine a philosophical point of view in class management and discipline. Individuals' philosophical perspective on issues of life including professional practices is also a product of beliefs system.

Since the essence of classroom management is to facilitate effective teaching/learning, models on classroom management stem from beliefs about the nature of teaching and learning. Conceptualization of models on classroom management is rooted in the two major learning approaches: Behaviorism and constructivism. The behaviorists' philosophical concept of learning is oriented towards teacher-centered. It is described by OECD (2009) as direct transmission beliefs about learning and instruction. This view sees students as passive recipients of knowledge as the teachers dominate the whole process of learning. Teachers are at the centre of attention. This approach is authoritarian in nature (Brannon, 2010; Gallagher & Goodman, 2008). The constructivists on the other hands see students as active participants in the process of knowledge construction and acquisition and allow students to play active role in instructional activities. This approach is students or learners-centered. Students are allowed to share control of the classroom activities, themselves and their behavior (Dollard & Christensen, 1996).

Resulting from synthesis and integration of different theoretical perspectives on classroom management approaches, continuum of control emerged in the literature (Glickman & Tamashiro, 1980; Wolfgang & Glickman, 1980; Wolfgang & Wolfgang, 1995; Martin & Sass, 2010; Sass, Lopes, Oliveira, & Martin, 2016). These are (i) non-interventionist, (ii) interventionist, and (iii) interactionalist. The non-interventionist classroom control philosophy is premised on the beliefs that students have a natural desire to learn with inherent competence in resolving emanating problems from classroom interactions (Sabanci & Özyildirim, 2020). What is required for the students to utilize their potentials is the necessary support and opportunity. In the non-interventionist approach, the level of teacher's classroom control is minimal. Teachers are expected to take the role of facilitators rather than directing or controlling the entire classroom learning process absolutely. This approach shares to a large extent the tenets of constructivist learning perspectives. In other words, non-interventionist is more of student-centered than teacher-centered (Brannon, 2010; Sass, Lopes, Oliveira, & Martin, 2016).

While non-interventionist is on the one end, interventionist is on the other end of the control continuum. This approach plays more emphasis on the role of the outer environment in shaping human behavior. This perspective shares many things in common with behaviorist ideology (Glickman & Wolfgang, 1978; Brannon, 2010). It is believed in this approach that children lack rational ability to control their behavior themselves and the adults have to fill the gap. Teachers employing this approach in the classroom exhibited such behaviors as leading the class with classroom rules and procedures without negotiation or students' impact. They do not value students' autonomy and do not expect students to self-regulate their learning (Lopes, Oliveira, & Martin, 2016) and this approach is teacher-centered in orientation.

Interactionalist approach to classroom control stems from the fact that neither only teachers nor students can effectively control the classroom teaching/ learning intricacies. There is an emphasis on teachers- students' collaboration and as a result interactionalist lies a midpoint of the two extremes of non-interventionist and interventionist. In other words, an interactionalist teacher is neither a pure non-interventionist nor a pure interventionist. Interactionalist draws strategies from the other two extremes and emphasizes on teacher-student relationships (Martin & Sass, 2010). However, teachers' classroom management orientation may not remain the same throughout a professional life time as the experience becomes accumulated, there is a tendency for change or adjustment due to more experience.

On the job experience is expected to contribute positively to professional effectiveness. Therefore, as the years of teachers' teaching experience increase, it is expected of the teachers to step up in classroom management prowess. Study suggests that expert teachers tend to be more significantly effective at predicting classroom management events than their novice counterparts (Wolff, van den Bogert, Jarodzka, & Boshuizen, 2014). Martin, Yin and Mayall (2006) found significant difference between novice and experienced teachers on both instructional management and people management subscales scores but in opposite direction. It was found that the experienced teachers scored significantly more controlling than novice teachers in instructional

management but less controlling in people management subscale. Yasar's (2008) findings indicated that primary school teachers showed preference for student-centered management approach and that years of teaching experience significantly influenced teachers' classroom management approach. It was found that only the adopted classroom management approach of teachers with teaching experience of more than sixteen years was significantly different from others while classroom management approaches of teachers with between 1-5 years, 6-10 years and 11-16 years were not significantly different from one another. Ünal and Ünal's (2012) study on 268 elementary teachers found a significant difference in the behavioral and instructional management subscale of classroom management on the basis of teacher's years of teaching experience. Their findings also suggest that teachers were more interventionist both on behavioral and instructional management and that teachers with higher number of years of teaching experience favoured maximum teacher control (Interventionism) than others. Though, Berger, Girardet, Vaudroz and Crahay (2018) reported that teaching experience was positively related to self-efficacy and beliefs in constructivism but did not impact on practices.

This study was set to examine teachers' classroom management styles alongside the behavioral and instructional management styles. Specifically, the objectives of the study were to:

1. examine the nature of classroom management approaches of the teacher-behavior versus Instructional management styles,
2. determine teachers' control beliefs on the two approaches of management styles.
3. determine the influence of years of teaching experience on teachers' control beliefs.

Research Questions

1. What is the nature of classroom management approaches of the teachers?
2. What are the teachers' control beliefs on the two approaches of classroom management styles?

Hypothesis

Teachers' control ideology does not depend on their years of teaching experience

Methodology

The study adopted a survey design. The population of the study comprised all the senior secondary school teachers in Osun State, Nigeria. The sample size comprised 205 senior secondary school teachers selected across Osun Central Senatorial districts in the State using a simple random sampling technique. Out of 10 LGAs in the Senatorial district, seven (7) LGAs were selected using simple random technique. In each selected LGA, three (3) senior secondary schools were also selected and 10 teachers were further selected using simple random sampling techniques. However, responses of five copies of the administered instrument were grossly incomplete and therefore removed from the sample and this reduced the sample from 210 to 205 participants. The participants comprised 75 (36.6%) of males and 130 (63.4%) of females in which 90(43.9%) were below the age of 25 years, 94(45.9%) were of age 25-41 years, while 21(10.2%) were of age 42 years and

above. In terms of their academic qualification, 56(27.3%) had NCE, 55(26.8%) had HND, 74(36.1%) had Bachelor degree in education, 10(4.9%) had Bachelor degree but not in Science, 4(2.0%) had master degree while 6(2.9%) indicated others degree. In addition, 84(41.0%) had teaching experience less than 5 years, 98(47.8%) had between 5-15 years of experience while 23(11.2%) had above 15 years of teaching experience. Behavior and Instructional Management Scale (BIMS) developed by Martin and Sass (2010) was slightly adapted as the original response format of the scale was changed and items that measured teachers' demographic information were included before it was used for the study. According to Martin and Sass (2010), behavior al management involves teachers' pre-planned efforts to prevent classroom misbehavior and teachers' response to such behavior. It takes the form of establishing rules, forming a reward structure, and providing opportunities for input from the students. The instructional management focuses on teachers' instructional aims and methodologies. Instructional management is an attempt to manage classroom teaching/learning activities with high level of student engagement. This is done through encouraging active participation of students in the classroom as well as factoring the students' nature, interest, need and background into lesson design.

BIMS consists of 24 items of which 12 odd numbered items measured Behavior al and 12 even numbered items measured instructional management style. The original scale took on a six-point Likert scale of “Strongly Agree, Agree, Slightly agree, Slightly disagree, Disagree and Strongly disagree. However, the response pattern of the adapted one is shortened to a four-point Likert scale response format of Strongly Agree, Agree, Disagree, and Strongly Agree. Nevertheless, items such as 4, 6, 9, 10, 11, 12, 14, 18 and 24 were to be reversed in scoring. The psychometric information of items on BIMS proves it to be valid and reliable scale. Martin and Sass (2010) reported an internal consistency reliability coefficient of .774 and .777 respectively for Behavior al and Instructional subscales. A score for each subscale is obtained by averaging responses across all items with high subscale scores indicating a more control or interventionist while lower scores indicate a less control or non-interventionist. Median scores on the subscales can be considered as interactionalist. The adapted version of BIMS was validated by experts in Educational Management and Test and Measurement. In this current study, moderate Cronbach's Alpha reliability coefficients of .68 and .62 were obtained respectively for items on Behavior al and Instructional subscales when the instrument was pilot-tested. Data collected was analyzed using percentages, mean, t-test and Chi-square statistical techniques.

Results

Research Question 1: What is the nature of classroom management approach of the teachers?

Table 1: Nature of Classroom Management Approach of the Teachers

Approach	n	Mean	SD
Behavior al	205	3.06	.30
Instructional	205	2.42	.20

Result in Table shows that the teachers used behavior al classroom management approach (M= 3.04, SD= .30) than instructional classroom management approach (M= 2.42, SD= .20). The significant difference or otherwise of the two approaches is determined the result is shown in Table 2.

Table 2: Test of Significant Difference in the Two Classroom Management Approaches Adopted by the Teacher

Management Approach	Mean	N	SD	SEM	t	df	p
Behavior al	3.06	205	.30	.02	25.54	204	.000
Instructional	2.42	205	.20	.01			

As shown in Table 2, there is a significant difference in the classroom management approaches adopted by the teachers. Teachers' use of behavior al classroom management approach is significantly different from the use of instructional management approach.

Research Question 2: What are the teachers' control beliefs on the two approaches of classroom management styles?

Table 3: Teachers' Control Beliefs on Behavior al and Instructional Classroom Management Styles

Control Beliefs	Behavior al		Instructional	
	n	%	n	%
Non-Interventionist	89	43.4	84	41.0
Interactionalist	23	11.2	18	8.8
Interventionist	93	45.4	103	50.2
Total	205	100.0	205	100.0

It shows in Table 3 that the teachers are more of interventionist in both behavior al (45.4%) and instructional (50.2%) than in non-interventionist 43.4% and 41.0% respectively in the two classroom management styles. Only 11.2% and 8.8% of the teachers had interactionalist control beliefs.

Hypothesis: Teachers' control ideology does not depend on their years of teaching experience

Table 4: Chi-square Analysis of Influence of years of teaching experience on teachers' control beliefs

(Behavioral)						
Years of Teaching Experience	Classroom Control Beliefs			χ^2	df	p
	Non-interventionist	Interactionist	Interventionist			
<5yrs	24(27.0%)	10(43.5%)	50 (53.8%)	84(41.0%)		
5-15yrs	55(61.8%)	13(56.5%)	30(32.3%)	98(47.8%)	4	.001
> 15yrs	10 (11.2%)	0(0.0%)	13(14.0%)	23(11.2%)		
Total	89(100%)	23(100%)	93(100%)	205(100%)		
(Instructional)						
Years of Teaching Experience	Classroom Control Beliefs			χ^2	df	p
	Non-interventionist	Interactionist	Interventionist			
<5yrs	34(40.5%)	10(55.6%)	40(38.8%)	84(41.0%)		
5-15yrs	39(46.4%)	4(22.2%)	55(53.4%)	98(47.8%)	4	.111
> 15yrs	11(13.1%)	4(22.2%)	8(7.8%)	23(11.2%)		
Total	84(100%)	18(100%)	103(100%)	205(100%)		

Results in Table 4 show that teaching experience has a significant influence on teachers' classroom control beliefs in behavior management styles, χ^2 (n = 205) = 19.93, df = 4, p < .05 but not in instructional management style, χ^2 (n = 205) = 7.53, df = 4, p > .05.

Result shows that 61.8% of non-interventionist teachers had between 5-15 years of teaching experience, 56.5% of the interactionalist teachers had less than 5 years while 53.8% of the interventionist teachers also had less than 5 years of teaching experience.

Discussions

The finding of the study showed that teachers significantly utilized behavior al classroom management style than instructional management style. This finding therefore corroborates Martin and Sass (2010) that teachers engaging behavior al management approach tend to control classroom through establishing rules, forming a reward structure, and providing opportunities for input from the students.

Findings of the study also revealed that teachers' classroom control beliefs are more of interventionist than non-interventionist in both behavior al and instructional management styles. About 20.0% of the teachers are interactionalist. This outcome suggests that the teachers are oriented towards teacher-centered teaching/learning approach. This finding further lends credence to the finding in research question one as interventionist ideology share many things in common with behavior ist ideology (Glickman & Wolfgang, 1978; Brannon, 2010) which believed that children lack rational ability to control their behavior themselves and the adults have to fill the gap. The finding is consistent with Ünal and Ünal's (2012) study who found that teachers were more interventionist both on behavior al and instructional management but contradicts Yasar's (2008) findings that the majority of primary school teachers showed preference for student-centered management approach.

It was also revealed in the findings of this study that teaching experience had a significant influence on teachers' classroom control ideology/beliefs in behavior al management approach but not in instructional approach. The majority of non-interventionist and interactionalist teachers were experienced teachers (5-15 years) while the majority of interventionist teachers were novice teachers (< 5 years of experience). This finding suggests a possibility that experienced teachers tend to adopt student-centered learning approaches than their less experienced counterparts. The current finding is in line with findings of Martin, Yin and Mayall (2006), Yasar (2008) and Ünal and Ünal (2012) that all found years of teaching experience as a significant factor in teachers' classroom management approach. In other words, the current findings agree with previous finding on the existence of significant association between teachers' classroom management approach and their years of experience. However, on specificity of the nature of relationship, the current study found that the majority of non-interventionist and interactionalist teachers were experienced teachers (5-15 years) which contradicts findings of Ünal and Ünal (2012), and Martin, Yin and Mayall (2006) which suggest that teachers with higher number of years of teaching experience favored maximum teacher control (Interventionism) than others.

Conclusion and Recommendations

The classroom management styles of the teachers in Osun State secondary schools is more of behavior al than instructional. Similarly, classroom ideology of the teachers showed their beliefs in total control of the classroom during interactions with the students.

This is an evidence of teacher-centered rather than student-centered approach to classroom interactions. This outcome suggests the need for the teachers to imbibe the constructivist ideology that places more emphasis on students than teachers in classroom teaching/learning interactions. Though, there seems to be likely changes in teaching beliefs as the majority of the interventionist were teachers of less than five years on the job. On the basis of the outcome of the study, a complete paradigm shift in teaching beliefs from traditional teacher-centered to modern student-centered needs to be advocated. The government can do more by making sure that the various higher institutions responsible for teachers training, factor in this philosophy in manpower training and retraining efforts.

References

- Brannon, T. S. (2010). *The Effects of classroom management beliefs/ideologies on students' academic success*. Unpublished Ph.D. Dissertation, California State University.
- Berger, J. L., Girardet, C., Vaudroz, C., & Crahay, M. (2018). Teaching experience, teachers' beliefs, and self-reported classroom management practices: A coherent network. *SAGE Open*, 1-12.
- Burden, P. (2017). *Classroom management: Creating a successful K-12 learning community*. John Wiley & Sons.
- Dollard, N., & Christensen, L. (1996). Constructive classroom management. *Focus on Exceptional Children*, 29(2), 1-12.
- Egeberg, H. M., McConney, A., & Price, A. (2016). Classroom management and national professional standard for teachers: A review of the literature on theory and practice. *Australian Journal of Teacher Education*, 41(7), 1-8
- Emmer, E., Evertson, C., & Worsham, M. E. (2006). *Classroom management for middle and high school teachers* (7th ed.). Boston: Pearson.
- Erden, F., & Wolfgang, C. H. (2004). An exploration of the differences in prekindergarten, kindergarten, and first grade teachers' beliefs related to discipline when dealing with male and female students. *Early Child Development and Care*, 174, 3-11.
- Gallagher, S., & Goodman, G. (2008). Classroom community culture for learning. *Counterpoints*, 145-162.
- Ghaith, G. & Yaghi, H. (1997). Relationships among experience, teacher efficacy, and attitudes toward implementation of instructional innovation. *Teaching and Teaching Education*, 13, 451-458.
- Glickman, C. D., & Tamashiro, R. T. (1980). Clarifying teachers' beliefs about discipline. *Educational Leadership*, 37, 459-464.
- Glickman, C.D., & Wolfgang, C. H. (1978). Conflict in the classroom: An eclectic model of teacher-child interaction. *Elementary School Guidance and*

Counselling, 82-87.

- Martin, N. K. & Sass, D. A. (2010). Construct validation of the behavior and instructional management scale. *Teaching and Teacher Education*, 26(5), 1124-1135
- Martin, K., Yin, Z., & Baldwin, B. (1998). Construct validation of the attitudes and beliefs classroom control inventory. *Journal of Classroom Interaction*, 1998, 33(2), 6-15.
- Martin, N. K., Yin, Z., & Mayall, H. (2006). *Classroom management training, teaching experience and gender: Do these variables impact teachers' attitudes and beliefs toward classroom management style?* A paper presented at the Annual Conference of the Southwest Educational Research Association, Austin, TX., February. Retrieved from <https://files.eric.ed.gov/fulltext/ED494050.pdf>
- Marzano, R. (2003). *What works in Schools: Translating research into action*. Virginia: ASCD Publications.
- Marzano, R. J., Marzano, J. S. & Pickering, D. J. (2003). *Classroom management that works: Research-based strategies for every teacher*. Alexandria, VA: Association for Supervision and Curriculum Development.
- McCreary, R. (2010). Classroom management definition. Retrieved from <https://classroom.synonym.com/classroom-management-definition-5438989.html>
- Ming-tok, H. & Wai-shing, L. (2008). *Classroom management: Creating a positive learning environment*. Hong Kong: Hong Kong University Press
- OECD (2009). *Creating effective teaching and learning environments: First results from the OECD teaching and learning international survey (TALIS)*. Paris: OECD
- Sabancı, A. & Özyildirim, G. (2020). The adaptation of behavior and instructional management scale into Turkish language context: Validity and reliability analysis. *International Journal of Educational Leadership and Management*, 8 (1), 34-59.
- Sass, D. A., Lopes, J., Oliveira, C. & Martin, N. K. (2016). An evaluation of the behavior and instructional Management Scale's psychometric properties using Portuguese teachers. *Teaching and Teacher Education*, 55, 279-290
- Ünal, Z., & Ünal, A. (2012). The impact of years of teaching experience on the classroom management approaches of elementary school teachers. *International Journal of Instruction*, 5(2), 41-60
- Wolfgang, C. H., & Glickman, C. D. (1980). *Solving discipline problems: Strategies for classroom teachers* (1st ed.). Boston: Allyn and Bacon.
- Wolff, C. E., van den Bogert, N., Jarodzka, H., & Boshuizen, H. P. A. (2014). Keeping an eye on learning: Differences between expert and novice teachers' representations of classroom management events. *Journal of Teacher Education*, 66, 68-85.
- Wolfgang, C. H., & Wolfgang, M. E. (1995). *The three faces of discipline for early*

childhood: Empowering teachers and students. Boston: Allyn and Bacon.

Yasar, S. (2008). Classroom management approaches of primary school teachers (Unpublished Master thesis). Middle East Technical University.

Yeo, L., Ang, R., Chong, W., Huan, V., & Quek, C. (2008). Teacher efficacy in context of teaching low achieving students. *Current Psychology*, 27, 192-204.

**ASSESSMENT OF SELECTED EMPLOYABILITY SKILLS AMONG
UNIVERSITY UNDERGRADUATES IN NORTH WEST NIGERIA**

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Abstract

Researches have shown persistent disconnect between job requirements and the school curriculum, especially at tertiary level of education. Most graduates and prospective graduates lack proper knowledge and orientation of the world of work, as well as the expectation of the employers. As such, they beacon on their academic achievement alone at the expense of every other Marketable skills necessary for a successful life. However, researchers have established that subject-specific knowledge and skills alone are unlikely to secure a graduate occupation in which they can be successful and satisfied. Hence, this study assessed selected employability skills among university undergraduates in North West Nigeria using survey research design. The population comprises all 2018/2019 final year university undergraduates in North West Nigeria. Multi-stage sampling technique using Simple Random and Proportional Sampling technique were employed to select 697 respondents from Usmanu Danfodiyo University, 350 respondents from Federal University Gusau and 330 respondents from Federal University Birnin Kebbi. The research instrument was a researcher-developed questionnaire entitled “Employability Indices Questionnaire”. The research instrument was validated by seven experts. Cronbach's Alpha was used to estimate a reliability coefficient of 0.82 and 0.96 for Employability Perception Scale and Employability Skills Scale respectively. Three research questions guided the study; while data collected were analyzed using summated scale. The findings of the study revealed that majority of university undergraduates in North West Nigeria perceived themselves to have high knowledge of employability, yet majority of the respondents perceived themselves to have high need of communication and problem-solving skills. This implies that the respondents have low level of communication and problem-solving skills. As such, it was recommended that

Universities in North-west, Nigeria should make communication and problem-solving skills a development priority area for undergraduates before their graduation.

Key words: Employability, Employability Skills, Assessment, and University Education.

Introduction

A common cry these days by both employers of labor and stake holder is that the quality of present-day graduates is on a rapid decline especially in the area of valuable skills. Employers of labor often complain that some graduate from Nigerian universities though academically qualified are unemployable, because they lack the requisite, essential skills or competencies needed in the job for sustainable employment (Sodipo, 2014). Sodipo affirmed that classroom teachings mostly focus on concepts and not marketable skills. Marketable skills demand that labor market participant should be equipped with complementary life skills like; problem solving, reflective and critical thinking, interpersonal and teaming skills, effective communication, character, integrity, self-esteem, self-discipline, organizing skills, leadership skills and the ability to translate ideas into action in addition to the professional competent in their chosen fields. These skills are rarely taught or stressed in schools, as such constituting a missing gap that limits a graduate's ability to be gainfully employed even when the jobs is there (Taiwo – Oguntuase, 2013; Fajana, 2018; Owolabi, 2018).

Zwane, Du-Plessis and Slabbert, (2014) reported that employers expressed dissatisfaction with the shortage of high-level competencies among graduates, such as handling customers professionally and pro-activeness when solving problems. More so, the National Universities Commission (NUC) in 2000 organized a curriculum review debate in collaboration with other stakeholders in the education industry and confirmed that the quality of graduates who left schools between 1995-2000 have actually declined in those critical skills. Also, Owolabi, Olorunlero and Oluwatosin (2013) found that upper basic schools in Ilorin South Local Government of Kwara State are most proficient in literacy, communication and interpersonal skills while they have either no skills or at best rudimentary skills in numeracy and ICT skills.

Sodipo (2010) also affirmed the above assertion in a survey carried out on the level of competency of tertiary education graduates employed in Ogun State Civil Service between 2004 and 2006. The finding of the research revealed that out of the 74 Directors of Administration in the Ministries, Agencies that responded to the questionnaire administered; 50% of the respondents agreed that the level of competency is poor, 33.3% of the respondents agreed that they do not possess the necessary skills required on the job. All the respondents disagreed that the graduates' knowledge in their area of specialization is outdated, 40% agreed that the graduates are not resourceful enough, 40% agreed that their command of English is poor, 33.3% of them agreed that they are not able to operate work equipment without retraining, 20% rated them good in ICT skill while 30% rated them good in numeracy or computation skills, organizational skills and interpersonal skill. It is on this background that this study assessed employability perception among university undergraduates in North West Nigeria.

More so, the report of the survey conducted by the Afterschool Graduate Development Center on youth employability in 2010 revealed that out of the 91 Human Resources Management and Personnel 48% rated young graduates poor in conceptual and critical thinking skill, 44% rated them poor in self-awareness, 39.6% rated them poor in time management, 36% rated them poor in global and commercial awareness, 34.1% rated young graduates poor in sense of career direction and emotional intelligence, 31.9% rated them poor in managing school to work transition. These evidences indicate a clear skill gap in tertiary education graduates in Nigeria; and has resulted to various degree of unemployment and underemployment.

Unemployment and under-employment are some of the socio-economic problems that threaten the peace and security of not only the unemployed graduates but Nigeria as a whole. These concepts have resulted to various levels of man's inhumanity to man; manifested by acts of terrorism, ritual killing, cannibalism, theft, banditry, etc. (Shuaibu, 2015). According to Ojo (1982), unemployment is a situation where by a person that is willing and able to work has no work that he is capable of doing available to him/her. This implies that unemployment does not connote the absence of vacancies in the economy as a whole, rather the unemployed may not possess the right skills for the available employment or he is unaware that the vacancies exist.

According to Iweala, (2014), 1.8 million Nigerians enter the job market yearly. The study conducted by Olafintoye and Ade (2013) also affirmed that there is no balance between labor supply and the demand for labor services in Nigeria today. While labor supply is growing in geometric progression, the demand for labor is growing in Arithmetic progression. This alarming social problem in our dear country (Nigeria) is a concern to these researchers because of its social and economic implications. Majority of the studies in this area focused on graduates who are already in the job market, sort data from employers of labor and other stake holders in other Geo-political Zones. Non to the best knowledge of the researchers investigated selected employability skills among university undergraduates in North West Nigeria.

Employability means the development of skills and adaptable workforces in which all those capable of work are encouraged to develop the skills, knowledge, technology and adaptability to enable them to enter and remain in employment throughout their working lives (HM. Treasury, 1997). According to Yorke and Knight (2006), employability is a set of achievements, understandings and personal attributes that make an individual more likely to gain employment and be successful in their chosen occupations. It refers to "work readiness" involving possession of the relevant skill, knowledge, attitudes and commercial understanding that will enable graduate to make productive contributions to the organizational objectives soon after commencing employment (Mason, Williams, & Cranmer, 2006). Employability is not static but a progressive process. It is more about learning, and the emphasis is less on employ and more on ability. Therefore, it is needful to train students to see themselves as job creators rather than job seekers. As a labor market participant, you can be a self-employer or a civil servant, whichever way demands' the possession of employability skills in addition to one's qualifications to be able to perform maximally.

Employability demands that an individual be equipped to put in his/her best in any chosen career and get the best from it as well, and not just working to survive. In the words of Brewer (2013), employability skills are:

the skills, knowledge and competencies that enhance a worker's ability to secure and retain a job, progress at work and cope with change, secure another job if he/she so wishes or has been laid off and enter more easily into the labor market at different periods of the life cycle.

It is about having the capacity to network and market oneself, navigate through a career and remain employable throughout life. It requires the ability to ask questions, acquire new skills, identify and evaluate options, understand rights at work including the right to a safe and healthy work environment, adapt successfully to changing situations and the courage to innovate. Just because a student is on a vocational course does not mean that somehow employability is automatic. Employability is more than about developing attributes, techniques or experience just to enable a student to get a job, or to progress within a current career. It is about learning and the emphasis is less on 'employ' and more on 'ability'.

Worthy of note is that core work skills are often not certified nor formally recognized. Core skills build upon and strengthen those developed through basic education, such as reading and writing, the technical skills needed to perform specific duties, and professional/personal attributes such as honesty, reliability, punctuality, attendance and loyalty. Core work skills are very important to labor market prospects because employers are seeking recruits that are job ready, not just those with the technical skills. It will enable the employees to respond quickly, reducing the time taken for a product to be conceptualized, manufactured, distributed and sold (ILO document, 2013).

Also, workers will be able to learn more quickly and perform more effectively, allowing for more innovative workplace where employees can offer novel ideas. Pitan (2015) attested that the generic skills commonly demanded by all sectors as identified by employers in Nigeria are communication and analytical skills. According to the ILO (2013) Review, the core skills that individuals need to be successful in attaining, retaining and advancing in employment are categorized under four broad headings namely: learning to learn, communication, teamwork and problem-solving. For the purpose of this study, only the communication and problem-solving skills will be evaluated. According to the ILO findings, some skills are more relevant than others depending on the type of employment, the sector, the size and nature of the enterprise, whether self-employed or working in the formal or the informal economy. More so, not all these skills and abilities are required for every job, nor does every job-seeker need every single one of them, but a good combination of the broad skill categories is desirable.

Communication skill is the media for sharing knowledge, interests, attitudes, opinions, feelings and ideas in order to influence and ultimately lead others and it includes oral, written, non-verbal and IT; ability to listen and observe in order to gain understanding, clearly and effectively relate ideas, use strategies and skills to work effectively with others. Research evidence has shown that effective communication results to positive outcomes such as improved family, peer and group relationships. Interpersonal

competence (learning to be empathetic, sensitive and able to make friends easily) and interpersonal communication skills such as the ability to express oneself, listen to, or resolve conflicts are among the life skills and assets that youths need to succeed. According to Mkpae et al (2013), employability requirements not only depend on skills as posited by many researchers and employers of labor but personal attributes and weaknesses of graduates in communication and writing skills.

Problem-solving is ability to evaluate information or situations; break it down into their key components; consider various ways of approaching and resolving it; and decide which is the most appropriate. This skill is very important as man cannot run away from problems and challenges. Life itself is a risk and as such what is needed is how to minimize and manage life problems. Employers want workers who will take the personal responsibility to make sure targets are met; who can see that there might be a better way of doing something and who are prepared to research and implement change; people who don't panic or give up when things go wrong, instead he/her seek a way around the problem and ensure a solution or a way forward (Brewer 2013). Research has affirmed that even though the Universities objectives encompasses employability development as one of its mandates, yet only limited skill training is practiced in most Nigeria Universities.

Method

The research design for this study is the Survey research design. The population comprises of all university undergraduates in North West Nigeria. There are seven states in North West Nigeria, which are Kaduna, Kano, Katsina, Kebbi, Jigawa, Sokoto, Zamfara. The target population consist of all 2018/2019 final year undergraduates in the selected States in the zone. They are: Sokoto (9880), Gusau (695) and Birni Kebbi (847) undergraduates (source: management and information system units of Sokoto, Gusau and Birni Kebbi Federal Universities). Multi-stage sampling approach was employed to select the sample for this study. *Stage one* was selection of states, simple random sampling technique was used to draw three states out of the seven states in North West Nigeria; the states selected are Kebbi State, Sokoto State and Zamfara State. *Stage two* was selection of institutions, purposive sampling technique was used to select Federal Universities in the selected states in North West Nigeria. They are: Usmanu Danfodiyo University Sokoto, Federal University Gusau and Federal University Birnin Kebbi. This is to ensure the homogeneity of variance of the Participants. *Stage three* was selection of subjects, proportionate sampling technique was used to select 1334 final year undergraduates (participants) from the selected Universities as guided by (Research Advisor, 2006).

The objectives of the study were to:

- i. evaluate employability perception of university undergraduates;
- ii. determine the extent of perceived communication skill needed by university undergraduates in North West Nigeria;
- iii. examine the extent at which university undergraduates in North West Nigeria perceived themselves as needing problem-solving skill.

To achieve the above objectives, the following research questions guided the study:

- i. To what extent do university undergraduates perceive themselves as employable?
- ii. What are the levels of perceived communication skills needed by university undergraduates in North West Nigeria?

- iii. To what extent do university undergraduates in North West Nigeria perceived themselves to have need of problem-solving skills?

The instrument that was used for data collection in this study was a researcher-developed questionnaire entitled “Employability Indices Questionnaire” (EIQ). The instrument consists of two sections, namely; section A and B. Section A contains 20 items that elicits information about undergraduates' self-perception of employability. The response patterns for the items in this scale are: Not at All -0 point, A Little - 1 point, Fairly Detailed – 2 point and Very Detailed – 3 points. Section B consist of items that elicit information on participants' communication and problem-solving skills. The response patterns are: Not True of Me -0 point, Somewhat True of Me - 1point and Very True of Me – 2 points. In order to ascertain the validity of the instrument, the questionnaire was given to seven experts in the field of educational research, measurement and evaluation and other lecturers in the department of social sciences education university of Ilorin. After which the researcher modifies the items in line with experts' comments and advice. Cronbach Alpha was used to obtain a reliability coefficient of 0.82 for the employability perception scale, and 0.83 for the employability skills scale.

Results

Research Question 1: To what extent do university undergraduates perceive themselves as employable?

The results of this section were classified into three categories namely; low, fair and high. The minimum scores a respondent can obtain is zero (0) and the maximum score he or she can obtain is 60 points. 60 divided by three, is equal to 20. Therefore, 0 to 20 = low level, 21 to 40 = Fair, while 41 to 60 = High Level.

Table 1: Summary Result of Respondents' Employability Perception Scale

Employability Level	Score Range	Frequencies	Percentage (%)
Low	0 – 20	3	0.2
Fair	21 – 40	299	22.4
High	41 – 60	1032	77.4
Total		1334	100

Table 1 shows that 3(0.2%) respondents perceived themselves to have low knowledge of employability, 299(22.4%) respondents perceived themselves to have fair knowledge of employability while 1032 (77.4%) of the respondents perceived themselves to have high knowledge of employability. As such, more of the respondents perceived themselves to have high knowledge of employability.

Research Question 2: What are the levels of perceived communication skills needed by university undergraduates in North West Nigeria?

The result of communication skills was obtained from nine items that elicits information on students' perceived communication skills need. The level at which

respondents perceived themselves to need this skill was graded into three levels namely; high, moderate and low levels. High level implies that the skill concerned should be made a development priority. Moderate level means that the skill concerned need attention or improvement while low level means an area of strength for the concerned respondents. The minimum scores a respondent can obtain is zero (0) and the maximum score he/she can obtain is 18 points. Therefore, 0 to 6 = low need, 7 to 12 = moderate need, and 13 to 18 = high need.

Table 2: Summary Result of Respondents' Communication Skill

Communication Levels	Score Range	Frequency	Percentage (%)
High	13 – 18	833	62.4
Moderate	7 – 12	417	31.3
Low	0 – 6	84	6.3
Total		1334	100

Table 2 indicates that 833(62.4%) of the respondents perceived themselves to have high need of communication skill, 417(31.3%) perceived themselves to have moderate need of communication skill while 84(6.3%) perceived themselves to have low need of communication skill. This implies that majority of the respondents in this study perceived themselves to have high need of communication skill.

Research question 3: To what extent do university undergraduates in North West Nigeria perceive themselves to have need of problem-solving skills?

Problem solving scale has twelve items, the minimum scores a respondent can obtain is zero (0) and the maximum score he/she can obtain is 24 points. Therefore, 0 to 8 = low level, 9 to 16 = moderate level, and 17 to 24 = high level.

Table 3: Summary Result of Respondents' Problem-Solving Skill

Problem Solving Levels	Score Range	Frequency	Percentage (%)
High	17 – 24	946	70.9
Moderate	9 – 16	315	23.6
Low	0 – 8	73	5.5
Total		1334	100

Table 3 indicates that 946(70.9%) of the respondents perceived themselves to have high need of problem-solving skills, 315(23.6%) perceived themselves to have moderate need of problem-solving skills, while 73(5.5%) perceived themselves to have low need of problem-solving skills. This result also showed that majority of the respondents have high need of problem-solving skills, which implies that the respondents have low problem-solving skills.

Discussion of the Findings

The first major findings of this study revealed that majority of the respondents

(1032) representing 77.4% of the respondents perceived themselves to have high knowledge of employability, 22.4% of the respondents perceived themselves to have fair knowledge of employability while only 0.2% of the respondents perceived themselves to have low knowledge of employability. This finding confirmed the survey of Sodipo (2010) who found that all the respondents disagreed that the graduates' knowledge in their area of specialization is outdated.

Another finding of this study showed that majority of the respondents in this study perceived themselves to have high need of communication skill. 833 representing 62.4% of the respondents perceived themselves to have high need of communication skill, 31.3% have moderate need of communication skill while 6.3% perceived themselves to have low need of communication skill. This finding contradicts the report of Owolabi, et al (2013) who found that upper basic students in Ilorin South Local Government of Kwara State are most proficient in literacy, communication and interpersonal skills. It also agrees with Sodipo (2010) whose findings revealed that 60% of the respondents rated tertiary education graduates employed in Ogun State Civil Service between 2004 and 2006 good in communication skills. This implies that students in these areas have better command of English language than the students in North West Nigeria. Also, this finding agreed with Mkpae et al (2013) who investigated job requirements and graduates' employability in Nigeria, and found that graduates are weak in communication and writing skills.

Further finding revealed that majority of the respondents perceived themselves to have high need of problem-solving skill. The result showed that 946 representing 70.9% of the respondents perceived themselves to have high need of problem-solving skills, while 23.6%, and 5.5% perceived themselves to have moderate and low need of problem-solving skills respectively. This finding agrees with the report of the survey conducted by the Afterschool Graduate Development Center Lagos on youth employability in 2010, which revealed that out of the 91 Human Resources Management and Personnel, 48% rated young graduates were found to be poor in conceptual and creative thinking. Another reason for this result could be that prospective graduates do not see themselves as problem solvers. Rather, they conceived education as school, and has regarded schooling as an unending solution to all problems.

Conclusion

Based on the findings of this study, it was concluded that university undergraduates in North West Nigeria have high need of communication and problem-solving skills. University undergraduates' employability perception was not bad as was evidenced by the participants' high level of employability perception; therefore, it can be inferred that plans for learning focused mainly on the cognitive domain, to the neglect of skills that are associated with both character and industry. As such, it was recommended that communication and problem-solving skills should be made a development priority area for university undergraduates in North West Nigeria. Also, both instruction and assessment of undergraduates should challenge and develop students' communication, problem solving and other relevant life-long learning skills before their graduation.

References

- Abiri, J. O. O. (2007). *Elements of measurement, evaluation and statistical techniques in education*. Ilorin: Bamitex Printing and Publishing.
- Akinyemi, S., Ofem, I. B., & Ikuenomore, S. O. (2012). Graduate turnout and graduate employment in Nigeria. *International Journal of Humanities and Social Science*. 2(14), 257-265.
- Ali, A. (2006). *Conducting research in education and the social science*. Enugu: Tashiwa Networks ltd.
- Brewer, L. (2013). Enhancing youth employability: What? Why? How? Guide to core work skills. Skills and Employability Department; *International Labor Organization*, Cambridge, 1-45.
- Fajana, S. (2018). *Employability of Nigerian graduates: issues and reality*. A lead paper presented at the first student conference of the department of industrial relations and personnel management; University of Ilorin, Ilorin-Nigeria.
- Federal Republic of Nigeria (2004). *National policy on education*, 4th edition. Lagos, Nigeria: Educational Research and Development Council (NERDC).
- HM. Treasury (1997). *Treasury press release 122/97, 13th October: Gordon Brown unveils UK employment action plan*. London: HM Treasury.
- International Labor Organization (ILO) 2013. Enhancing Youth Employability: The Importance of Core Work Skills. Skills for Employment Policy Brief. From <http://www.ilo.org/skills/pubs/WCMS_234467/lang-en/index.htm>
- Mason, G., Williams, G. & Cranmer, S. (2006) *Employability skills initiatives in higher education: what effects do they have on graduate labor outcomes?* London: National Institute of Economic and Social Research. GLM293.
- Mkpae, S. G., Obowu, V. A. & Chikwe, C. K. (2013). Evaluating job requirements and graduate employability in Nigeria. *Nigeria Journal of Educational Research and Evaluation*. (12), .32-42.
- National University Commission (2004). *Labor market expectations of Nigeria graduates*. Report of national needs assessment surveys.
- Nigeria Institute of Personal Management (2000). In Okebukola, Adedipe, Uvah (eds.). . Ibadan: Heinemann Educational Nig. Plc
- OJO, O. O. (1982). *A' level economics textbook for West African*. Ibadan: Onibonoje press and Book industries (Nigeria) Ltd.

- Owolabi, H. O., Olorunlero, J. I. & Oluwatosin A. O. (2013). *Effectiveness of Basic Education in Equipping upper basic school final year students in Kwara State with Employable Skills*. A Paper Presented at 15th Annual National Conference of Nigerian Association of Educational Researchers and Evaluators, Held at the University of Ilorin, Ilorin, Nigeria.
- Owolabi, H.O. (2016). Evaluation in the practice of teaching. In A.A. Adegoke, R.A. Lawal, A.G.A.S. Oladosu & A.A. Jekayinfa (Eds.), *Introduction to teaching methodology*. Ilorin: Haytee Press and Publishing
- Pitan, O. S. (2016). Towards enhancing university graduate employability in Nigeria. *Journal of Sociology Society Anthropology*, 7(1), 1-11.
- Shuaibu, F. B. (2015). *Psychological perspectives of insecurity in the Nigerian school environment*. A Keynote address presented at Nigerian society for educational psychologist (NISEP). On the annual National conference held at college of education, Zuba, FCT Abuja. October, 27 2015.
- Sodipo, O. (2014). Employability of tertiary education graduates in Nigeria: Closing the skills-gap. *Global Journal of Human Resource Management*, 2(3), 28–36.
- Taiwo – Oguntuase, S. (2013). *Employability of Nigerian graduate – Myth or reality*. Article in Daily Independent Newspapers, 2nd October 2013. <http://dailyindependentnig.com>
- Yorke, M. Knight P.T. (2006). *Embedding employability into the curriculum. learning and Employability series one*. York: Higher Education Academy.
- Zwane, F. N., Du Plessis, L. & Slabbert, E. (2014). Analysing the skills expectations in the South African tourism industry. *South African Journal of Human Resource*, 12(1), 1-9.

DEVELOPMENT AND VALIDATION OF CHEMISTRY STUDENTS' ACHIEVEMENT MOTIVATION INSTRUMENT

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Abstract

Achievement motivation is the internal pressures which can be triggered by external conditions that push learners to want to perform well in their learning tasks. It determines the zeal and vigour with which students pursue their studies in various subjects. Achievement motivation influences interest, study habits and level of attainment in the learning tasks. In Chemistry education, the various factors which influence students' achievement motivation and which can help the Chemistry teacher and school guidance counselor in advising students have not been identified and categorized. There is need to develop an instrument for determining the achievement motivation of students in the learning of Chemistry. This study was aimed at developing and factorially validating a scale for assessing students' achievement motivation in Chemistry at secondary school level. Three research questions were formulated to guide the study. The population of the study consisted of all the Senior Secondary School Chemistry students in Okigwe Education zone (1) of Imo State. The total number of schools used was ten (10) co-educational secondary schools which consist of five hundred and eighty-eight Chemistry students. In its final form, the scale, "Chemistry Students' Achievement Motivation Scale" (CSAMS), is a 40 item four-point scale that served as instrument for data collection. The appropriateness of each item of CSAMS was assessed by five experts from Chemistry education and educational Measurement and Evaluation. The reliability of the instrument was 0.85 using Cronbach Alpha internal consistency method. The data were analyzed using mean and standard deviation to answer research questions. Factor analysis further confirmed the validity of the scale as well as identifying the psychological constructs underlying Students' Achievement Motivation in Chemistry. Six constructs: Teacher's Personality, Classroom Environment, Students' Personality, Parents/Family, Peers/Classroom and Career Aspiration factors were identified to determine Students' Achievement Motivation in Chemistry. It was recommended that Chemistry teachers should adopt the CSAMS for stimulating the achievement motivation of their Chemistry students.

Key words: Assessment, Instrumentation, Achievement Motivation and Learning

Introduction

Achievement motivation is the personal interest and determination of the individual to succeed in whatever activities the individual engages in. It is the need to perform well or the striving for success as evidenced by persistence of effort in the face of difficulties. Tracy (2005) states that everything that happen to you, everything you become and accomplish is determined by the way you think and use your mind. Achievement motivation can therefore be defined as the need to perform well or the striving for success and evidenced by persistence and effort in the face of difficulties. Schunk (2012) defined achievement motivation as the need for success or the attainment of excellence. Achievement motivation is the tendency to set and work hard to meet personal standards and to attain goals within one's social and economic environment (Ziegler, Schmuke, Egloff & Buhner, 2015). It is thus a personality characteristic, and may be regarded as central determiner of individuals approach or attitude to tackling of tasks whether in school or in the social and economic spheres.

Students' Achievement Motivation in their school works/tasks determines the zeal and persistence with which they face the tasks and the level of success they attain. It is the reason for students' selecting and enrolling in some subjects while rejecting to select others (Atkinson, 1999). It influences their participation in the learning activities in the subjects, the level of interest they indicate as well as the level of proficiency they aspire to attain in the learning outcomes expected for the subjects. It can thus be said that achievement motivation determines the level of willingness with which students attend lessons for particular subjects, carry out assignments, obey teacher's instructions, and look for further information on the lessons which the teacher has taught. A student that is motivated to learn Chemistry, for instance, would go the extra mile to look for information and to complete assignments given by the teacher. Such motivated students spend plenty of their free time learning the subject and mastering the various concepts and techniques required in the subject. Consequently, such a motivated student performs well in Chemistry, given that other factors of good performance have been taken care of. Gesinde (2000) posits that the urge to achieve varies from one individual to other, while for some individuals need for achievement is very high whereas for others it may be very low, what is responsible for the variation could be the fact that achievement motivation is believed to be learnt during socialization process and learning experiences. McCelland, Iroegbu, Chukwudire, Nkwocha and Onyemerekeya (2003) stated that student's achievement motivation is an individual phenomenon tied to their academic achievement in school subjects.

Nigerian students' achievement in Chemistry at the Senior School Certificate level has over the years been poor and unimpressive a situation that is very disturbing to all stakeholders in science and technology education in the country (Akalonu, 2011). Both the National Examinations Council (NECO) Chief Examiner's Reports and the West African Examinations Council (WAEC) Chief Examiner Report (2014-2018) have consistently shown a general but serious underachievement of students in Chemistry. The implication of this persistent students' poor achievement in Chemistry is that students are

not working hard enough to improve their achievement in Chemistry. One therefore wonders if students actually have the motivation to learn Chemistry in Nigerian secondary schools. If students are really made to understand the importance of Chemistry as a central science subject, it is expected that they would work much harder to pass well their external examinations in Chemistry.

Students have various reasons for choosing to enroll in certain school subjects, or working hard in their chosen subjects. These reasons may be described as factors of students' achievement motivation in the learning of the subject. For instance, a student might want to enroll in a school subject because his friend has enrolled in the subject, or because his/her family member advised her to enroll. It is also possible that a student enrolls and works hard in a school subject because he finds the subject interesting and easy to learn, or she requires the subject for admission into some professional courses at a higher level of education. Whatever the reasons that make students select to enroll in a subject, and to work hard to perform well in it, they are called factors of achievement motivation.

Teachers have a responsibility to make students work hard and learn effectively in school subjects. Matthew (2011) stressed that teachers who creates warm and accepting atmosphere will promote effort and favourable attitudes towards learning. Iroegbu *et.al* (2003) explained that teachers who can keep his students well motivated have won more than half of the battle in learning. This implies that teachers have to arouse students' interest or motivate the students in school subjects, but the responsibility to motivate students to learn would be difficult to carry out effectively if the teachers do not know the various factors that govern students' achievement motivation and interest to learn certain school subjects. It is therefore important that factors that influence students' motivation in particular school subjects should be clear to subject teachers. It is then that the teachers would adopt various credible strategies using these factors to increase students' achievement motivation which makes them decide to work hard in the subjects, and to achieve highly.

Therefore, to motivate the students to work hard in their study of Chemistry, the subject teachers need to understand the needs of the students, their values and career aspirations. Keefe and Jenkins (2004) explained that there are some students who are motivated by rewards, praises or avoidance of punishments. Ngwoke (2010) asserts that students who are externally motivated tend to possess more irrational belief while internally motivated students involve more in learning. They would depend on the several other factors that influence students in their learning of Chemistry if their efforts at motivating the students would be effective. The teachers should also be in position to accurately identify the level of achievement motivation which their Chemistry students have. It is these pieces of student related information that Chemistry teacher needs to find ways of motivating the students for greater interest and achievement in Chemistry. This calls for emphasis on the measurement of students' achievement motivation using valid and reliable instrument. Since students' achievements have been linked to their level of achievement motivation. But the reliable and valid instrument seems scarce in schools, since most of the science teachers involved in science pedagogy is unskilled in instrument and validation (Chukwudolue, 2002). This means that Chemistry teachers have to rely on instruments

that are already been developed and validated by experts.

However, available literature has not shown that Nigerian Chemistry teachers are used to finding out the factors that motivate their students to learn Chemistry or the students' level of achievement motivation in the subject. There is little or no evidence in the literature of the availability of any instruments which Nigerian Chemistry teachers use for assessing students' level of achievement motivation and the factors that influence their motivation. It thus appears that the Chemistry teachers lack the facility to help to build up the internal drive of their students so as to improve their efforts and subsequently achievement in school certificate Chemistry external examination. Therefore, there is the need to develop and validate an instrument, which could be applied by Chemistry teachers to determine the achievement motivational status of their students, with a view to effectively counseling the students on Chemistry studies. The main purpose of this study is to develop and factorially validate an instrument for assessing Chemistry students' achievement motivation and the factors that influence their learning of Chemistry.

Research Questions

Three research questions were formulated to guide the study:

1. What is the reliability coefficient of the instrument (CSAMS) developed to measure students' achievement motivation to learn Chemistry?
2. What are the factor loadings of the items of the instrument (CSAMS) developed to measure students' achievement motivation to learn Chemistry?
3. What are the mean scores of students' achievement motivation to learn Chemistry as measured by CSAMS?

Method

The research design adopted for the study was an instrumentation research design. The population for the study was one thousand five hundred and eight (1508) Chemistry students comprising of SS1=1012, SS2=235 and SS3=261 distributed with Okigwe Education zone one in Imo State. Samples of 588 students were selected using purposive sampling techniques. Chemistry Students' Achievement Motivation Scale (CSAMS) was developed by the researchers, validated and used for data collection. The reliability coefficient of 0.98 was obtained using Cronbach alpha. The questionnaire had 40 items on a four-point rating scale ranging from Strongly Agree (SA) 4points, Agree (A) 3points, Disagree (D) 2points and Strongly Disagree (SD) 1point depending on the nature of the statement. The mean score of 2.5 and above for each scored item indicates acceptance of the statement while any mean score below 2.5 indicates a disagreement or rejection of the statement described by the item. The researchers and research assistants helped in data collection. The results obtained were analyzed using descriptive statistics

Results

Table 1: The Reliability Coefficient of Chemistry Students' Achievement to Learn Chemistry Scale (CSAMS) using Cronbach Alpha Coefficient.

S/N	Factors	No of items	Reliability coefficient of factors
1.	Teacher's Personality Factors	8	0.82
2.	Classroom Environment Factors	8	0.91
3.	Students' Personal Factors	5	0.86
4.	Parent/Family Factors	7	0.77
5.	Peers/Classmates Factors	5	0.84
6.	Career Aspiration Factors	7	0.92
Pooled Result		40	0.85

Number of cases=588, Number of factors=6, Cronbach Alpha=0.85

Results in Table 1 showed that the reliability coefficient of the whole instrument (CSAMS) is 0.85 while the internal consistencies estimate of the six factors namely: Teacher's Personality Factors, Classroom Environment Factors, Students' Personal Factors, Parent/Family Factors, Peers/Classmates Factors and Career Aspiration Factors were 0.82, 0.91, 0.86, 0.77, 0.84, and 0.92 respectively using Cronbach alpha. This indicates that the total instrument which has 40 items is reliable enough for finding out students' achievement motivation to learn Chemistry in secondary schools.

Table 2: Factor Analysis Results of CSAMS that are Considered Factorially Pure and Valid

Factors (Clusters)	Items	Factor Loading
Teacher's Personality Factors		
Our teacher's knowledge and skills in teaching makes me want to learn more in Chemistry.	3	0.558
Our teacher's honesty in judging students makes me want to learn Chemistry.	4	0.608
Our teacher's smartness and neatness make me want to learn more in Chemistry.	5	0.516
Our teacher's clear and audible voice while teaching makes me to learn Chemistry.	6	0.505
Our teacher's willingness to teach his lesson makes me want to continue in Chemistry.	7	0.531
The kind-heartedness of our teacher makes me want to learn Chemistry.	8	0.528

Our teacher's fairness makes me want to learn more in Chemistry.	10	0.601
The moral virtue of our teacher makes me want to continue with Chemistry.	11	0.663
Classroom Environment Factors		
I pay attention in Chemistry class to avoid punishment by my teacher.	12	0.810
Our teacher gives me lots of assignments and that makes me want to learn more in Chemistry.	13	0.571
Our teacher encourages active participation in Chemistry lessons and that makes me want to learn Chemistry.	14	0.587
Safety issues in Chemistry do not affect my wanting to learn Chemistry.	16	0.644
The friendly nature of Chemistry class makes me want to learn Chemistry.	17	0.356
Stories of great Chemists told by our teacher makes me to continue in learning Chemistry.	20	0.664
Praises for any correct answers by our Chemistry teacher encourages me to read hard in Chemistry.	21	0.551
Our Chemistry teacher's punctuality to lessons encourages me to learn Chemistry.	22	0.473
Students' Personality Factors		
To retain my good position in Chemistry, I read hard.	23	0.486
To avoid failure in Chemistry, I read hard.	24	0.355
The calculations in Chemistry make me to learn more in Chemistry.	28	0.701
The practical activities in Chemistry make me want to learn Chemistry.	29	0.678
My good grade in Chemistry makes me to learn more in Chemistry.	30	0.425
Parents'/Family Factors		
My parent's background in science makes me to learn Chemistry.	32	0.727
My parent's wish for science background in the family makes me to learn more Chemistry.	33	0.545
The Chemistry textbooks my parents bought for me encourages me to learn more in Chemistry.	34	0.354

My parent's encourages me to read hard and that makes me to learn more in Chemistry.	35	0.521
My parent's praises for my good performance makes me to learn more in Chemistry.	36	0.370
The extra-mural classes my parents organize for me makes me want to learn Chemistry.	37	0.370
My parent's instructions to do my Chemistry assignment at home makes me to learn more in Chemistry.	39	0.679
Peer/Classmates Influences		
My classmate's encouragement to read Chemistry makes me want to learn Chemistry.	41	0.750
My friend's interest in Chemistry makes me want to learn Chemistry.	43	0.513
My friend's good performance in Chemistry makes me want to learn Chemistry.	45	0.505
My friend's love for Chemistry makes me want to learn Chemistry.	46	0.694
My success in learning Chemistry will depend on the cooperation of my classmates.	48	0.760
Career Aspirations Factors		
My desire to become a chemist makes me want to learn more in Chemistry.	49	0.541
My desire to become a medical doctor makes me want to learn more in Chemistry.	50	0.351
My desire to become an engineer makes me want to learn Chemistry.	52	0.639
My desire to manufacture detergents and paints makes me to learn more in Chemistry.	53	0.615
My desire to become a laboratory technician makes me to learn more in Chemistry.	54	0.497
My desire to manufacture fertilizer makes me to learn more in Chemistry.	55	0.498
My desire to work in the chemical industries makes me to learn more in Chemistry.	56	0.441

The data in Table 2 show that six factors and 40 items emerged factorially valid. For teacher's personality factor, three items (1, 2 and 3) were found to be factorially impure and were discarded. The items that were found to be factorially pure were presented on the Table. The factor loadings of the eight items in this cluster ranges from 0.505 to 0.663. On the classroom environment factor, there were also eleven (11) items. Three items (15, 18 and 19) dropped and eight items survived. The factor loadings of the eight items range from 0.356 to 0.810. On students' personal factor, there were nine (9) items. Four items dropped (25, 26, 27 and 31) and five items survived. The factor loadings of the five items range from 0.355 to 0.701. On parent/family factor, two items dropped and seven survived. The factor loading of the seven items ranges from 0.354 to 0.792. On peers/classmate factor, there were eight (8) items. At the end of the factor analysis, three (3) items dropped (42, 44 and 47) and five items survived. The factor loading of the five items ranges from 0.505 to 0.760. On career needs factor, one item dropped (item51) after factor analysis and seven items survived. The factor loading of the seven (7) items ranges from 0.351 to 0.639. The factor loadings are appropriate as they are in line with Meredith (1969) postulate. The author recommends that items which loaded a minimum of 0.35 and were accepted as valid (Factorially Pure, FP), but items with factor loadings of less than 0.35 (Factorially Impure, FI) and items which loaded up 0.35 in more than two factors (Factorially Complex, FC) were rejected.

Table3: The Mean Scores and Standard Deviations of Scores of Students on Achievement Motivation Factors to Learn Chemistry

Cluster 1: Teacher's Personality Factors					
S/N Items	N	X	S.D	Decision	
1. Our teacher's knowledge and skills in teaching makes me want to learn more in Chemistry.	588	2.70	1.00	A	
2. Our teacher's honesty in judging students makes me want to learn Chemistry.	588	2.83	0.97	A	
3. Our teacher's smartness and neatness makes me want to learn more in Chemistry.	588	2.66	0.96	A	
4. Our teacher's clear and audible voice while teaching makes me to learn Chemistry.	588	2.65	1.06	A	
5. Our teacher's willingness to teach his lesson makes me want to continue in Chemistry.	588	2.71	1.09	A	
6. The kind-heartedness of our teacher makes me want to learn Chemistry.	588	2.89	0.87	A	
7. Our teacher's fairness makes me want to learn more in Chemistry.	588	2.82	0.96	A	
8. The moral virtue of our teacher makes me want to continue with Chemistry.	588	2.85	0.93	A	
Cluster mean		2.76	0.09	A	

$\bar{X}$ =Mean, S. D. = Standard deviation, N=Number of respondents, A= Agree

Table 3 shows data on the mean scores of students on achievement motivation factors to learn Chemistry in secondary school. The Table reveals that teacher's personality factors have mean scores ranging from 2.65 to 2.89, which are above the criterion mean of 2.50 and their cluster mean 2.76 is the decision point which shows that the respondents agreed that these factors motivate them to learn Chemistry. The cluster standard deviation is 0.08 which is less than one ($S.D < 1$). This implies that all the respondents had scores that were close to them. The scores did not scatter widely around the mean, showing strong general agreement of the respondents.

Cluster 2: Classroom Environment Factors					
S/N	Items	N	X	S.D	Decision
9.	I pay attention in Chemistry class to avoid punishment by my teacher.	588	2.59	0.88	A
10.	Our teacher gives me lots of assignments and that makes me want to learn more in Chemistry.	588	2.79	1.09	A
11.	Our teacher encourages active participation in Chemistry lessons and that makes me want to learn Chemistry.	588	2.66	1.11	A
12.	Safety issues in Chemistry do not affect my wanting to learn Chemistry.	588	2.78	1.03	A
13.	The friendly nature of Chemistry class makes me want to learn Chemistry.	588	2.85	1.04	A
14.	Stories of great Chemists told by our teacher makes me to continue in learning Chemistry.	588	2.72	0.90	A
15.	Praises for any correct answers by our Chemistry teacher encourages me to read hard in Chemistry.	588	2.78	0.98	A
16.	Our Chemistry teacher's punctuality to lessons encourages me to learn Chemistry.	588	2.73	1.09	A
Cluster Mean		588	2.74	0.08	A

X=Mean, S.D.=Standard deviation, N=Number of respondents, A= Agree

On classroom environment factors, all the items have means scores above the criterion point of 2.50 and their cluster means and standard deviations 2.74 and 0.08 respectively are the decision point which shows strong agreement of the respondents on achievement motivation to learn Chemistry.

Cluster 3: Students' Personal Factors

S/N	Items	N	X	S.D	Decision
17.	To retain my good position in Chemistry, I read hard.	588	2.80	1.02	A
18.	To avoid failure in Chemistry, I read hard.	588	2.91	0.99	A
19.	The calculations in Chemistry make me to learn more in Chemistry.	588	2.81	0.78	A
20.	The practical activities in Chemistry make me want to learn Chemistry.	588	2.80	1.04	A
21.	My good grade in Chemistry makes me to learn more in Chemistry.	588	2.73	1.07	A
Cluster Mean		588	2.81	0.06	A

$\bar{X}$ =Mean, S.D. =Standard deviation, N=Number of respondents, A=Agree

On students' personal factors, all the items have means scores above the criterion point of 2.50 and their cluster means and standard deviations 2.81 and 0.06 respectively are the decision point which also shows strong agreement of the respondents on achievement motivation to learn Chemistry.

Cluster D: Parents/Family Factors

S/N	Items	N	X	S.D	Decision
22.	My parent's background in science makes me to learn Chemistry.	588	2.57	0.97	A
23.	My parent's wish for science background in the family makes me to learn more Chemistry.	588	2.78	1.01	A
24.	The Chemistry textbooks my parents bought for me encourages me to learn more in Chemistry.	588	2.65	1.03	A
25.	My parents encourage me to read hard and that makes me to learn more in Chemistry.	588	2.88	0.94	A
26.	My parent's praises for my good performance makes me to learn more in Chemistry.	588	2.79	1.02	A
27.	The extra-mural classes my parents organize for me makes me want to learn Chemistry.	588	2.77	1.04	A
28.	My parent's instructions to do my Chemistry assignment at home makes me to learn more in Chemistry.	588	2.74	0.93	A
Cluster Mean		588	2.74	0.10	A

$\bar{X}$ =Mean, S.D.=Standard deviation, N=Number of respondents, A= Agree

Moreover, on parent/family factors, all the items have means scores above the criterion point of 2.50 and their cluster means and standard deviations 2.74 and 0.10 respectively are the decision point which also shows strong agreement of the respondents on achievement motivation to learn Chemistry.

Cluster D: Peers/Classmates Factors					
S/N	Items	N	X	S.D	Decision
29.	My classmate's encouragement to read Chemistry makes me want to learn Chemistry.	588	2.88	0.98	A
30.	My friend's interest in Chemistry makes me want to learn Chemistry.	588	2.78	1.03	A
31.	My friend's good performance in Chemistry makes me want to learn Chemistry.	588	2.61	1.04	A
32.	My friend's love for Chemistry makes me want to learn Chemistry.	588	2.80	1.02	A
33.	My success in learning Chemistry will depend on the cooperation of my classmates.	588	2.70	0.95	A
Cluster Mean		588	2.75	0.10	A

$\bar{X}$ =Mean, S.D.=Standard deviation, N=Number of respondents, A=Agree

On peers/classmates' factors, all the items have means scores above the criterion point of 2.50 and their cluster means and standard deviations 2.75 and 0.10 respectively are the decision point which also shows strong agreement of the respondents on achievement motivation to learn Chemistry.

Cluster F: Career Needs/Aspirations Factor					
S/N	Items	N	X	S.D	Decision
34.	My desire to become a chemist makes me want to learn more in Chemistry.	588	2.77	0.71	A
35.	My desire to become a medical doctor makes me want to learn more in Chemistry.	588	2.74	0.76	A
36.	My desire to become an engineer makes me want to learn Chemistry.	588	2.85	0.95	A
37.	My desire to manufacture detergents and paints makes me to learn more in Chemistry.	588	2.76	0.85	A
38.	My desire to become a laboratory technician makes me to learn more in Chemistry.	588	2.77	0.96	A
39.	My desire to manufacture fertilizer makes me to learn more in Chemistry.	588	2.61	0.96	A
40.	My desire to work in the chemical industries makes me to learn more in Chemistry.	588	2.65	0.98	A
Cluster Mean		588	2.74	0.08	A

$\bar{X}$ =Mean, S.D.=Standard deviation, N=Number of respondents, A=Agree

On peers/classmates' factors, all the items have means scores above the criterion point of 2.50 and their cluster means and standard deviations 2.74 and 0.08 respectively are the decision point which also shows strong agreement of the respondents on achievement

motivation to learn Chemistry.

Discussion of Findings

From research question 1 the result revealed that the reliability coefficient of the scale for assessing students' achievement motivation to learn Chemistry was 0.98. This value implies that the scale for assessing students' achievement motivation to learn Chemistry scale is very reliable and can be used to collect dependable data on students' achievement motivation to learn Chemistry. The clusters of the instrument CSAMS include: Teacher's Personality, Classroom Environment, Students' Personality, Parents/Family, Peers/Classroom and Career Aspiration factors. The finding supports the work of Chukwudolue (2002) which yielded reliability index of 0.94 and was used to develop and validate teachers' motivation assessment scale for secondary school teachers in Anambra State.

Research question 2 revealed that the factorial validation of sixteen (16) items were factorially impure, and were discarded. Only 40 items survived the factor analysis and were unevenly distributed among six factors identified in the study as relevant to students' achievement motivation to learn Chemistry.

Finally, research question 3 revealed that the six factors: Teacher's Personality, Classroom Environment, Students' Personality, Parents/Family, Peers/Classroom and Career Aspiration factors is accounted for students' achievement motivation to learn Chemistry in secondary schools. The observed result is not surprising because the interactions of the learner with his/her environment play a crucial role in active learning. The students in the secondary school level are at the formative stage and as such influenced by these common factors that help in learning, attitude and skill development. In specific terms teacher's personality as a factor of students' achievement motivation to learn Chemistry in this study is explained by eight variables. The findings support the work of Matthew (2011), which stressed that teachers who create warm and accepting atmosphere will promote effort and favourable attitudes towards learning. Also, Iroegbu, Chukwudire, Nkwocha, and Onyemerekeya (2003) explained that teacher who can keep his students well motivated has won more than half of the battle in learning.

The classroom environment factor examined in this study spelt out eight attributes that can explain students' achievement motivation to learn Chemistry. These attributes have been reported by Keefe and Jenkins (2004) that there are some students who are motivated by rewards, praises or avoidance of punishment. Ngwoke (2010) asserted that the students who were externally motivated tend to pose more irrational belief while internally motivated students involve more in learning. The teacher determines an incentive that is likely to motive a student at a particular time. Generally, self-motivation without rewards will not succeed.

Another factor identified in the study which is students' personal factor, stresses that students find satisfaction in learning based on the understanding that their goals are useful to them, based on the pure enjoyment of exploring new things. The findings support the work of Tracy (2005), which asserted that fear of failure is what persuades students to set

easier goals. Thus, the various reasons influencing student's success are factors of achievement motivation for the students. Also, studies conducted by Atkinson (1999) showed that a good percentage of students will work hard to achieve a task they do not enjoy, solely to maintain their high-grade point average or high rank in class. Thus, the student will be motivated towards learning of school subjects like Chemistry because they want to maintain their class rank.

The parental/family and peers/classmate factors were established in the study as achievement motivation factor in students' Chemistry learning. The findings seem to be in consonance with the assertion of Gesinde (2000) who posit that what is responsible for the variable in achievement could be the fact that achievement motivation is believed to be learnt during socialization processes and learning experiences. The author asserts further that those who have high achievers as their models in their early life experience develop the high need to achieve while those who have low achievers as their models hardly develop the need to achieve.

The career aspiration factor as reported in the study was explained by seven attributes. The findings support the work of Schunk (2012) who explained that the students' career aspiration determine the effort of the students towards achieving a better goal. In other words, the career students need to attain not only determine the subjects they choose in school but also the effort they make in those subjects which describes their levels of achievement motivation towards the school subjects.

Conclusion

Based on the results or findings of this study, it was established that reliability coefficient of the CSAMS was calculated to be 0.85 using the Cronbach alpha coefficient. The factor analysis revealed six factors containing clusters of items influencing achievement motivation to learn Chemistry. The six factors that accounted for the achievement motivation of student to learn Chemistry are: Teacher's Personality, Classroom Environment, Students' Personality, Parents/Family, Peers/Classroom and Career Aspiration factors.

Recommendations

Based on the findings the following recommendations were made.

1. Chemistry teachers should adopt the CSAMS instrument for stimulating the achievement motivation of their Chemistry students.
2. Chemistry teachers intending to stimulate students' achievement motivation in Chemistry should target to manipulate the various factors or constructs that determine or influence students' achievement motivation in Chemistry.
3. School Guidance Counselor should use this instrument to find the status of Chemistry students' achievement motivation in order to help students understand why they should select to enroll in Chemistry, and work hard in it to pass the required internal and external examinations in Chemistry.

References

- Akalonu, H.O. (2011). Towards result oriented Chemistry practical Chemistry examination at the ordinary level. *Journal of Science Teachers Association of Nigeria*, 25 (1), 33-34.
- Atkinson, E. (1999). Key factors influencing pupil motivation in design and technology. <http://scholar.lib.vt.edu/ejournals/JTE.vion2/Atkinson.html>.
- Chukwudolue, F. I. (2002). Development and validation of teacher motivation assessment Scale for secondary school teacher in Anambra State. *Unpublished (Ph.D.) dissertation, University of Nigeria, Nsukka*.
- Gesinde, A.M. (2000). Motivation. In Z.A.A. Omideyi (ed.) *Fundamentals of guidance and Counseling*. Ibadan: Kanead Publishers.
- Factors Analysis, Retrieved from <http://ssc.utexas.edu/docs/stat53.html> on 15/03/2020.
- Iroegbu, T.C., Chukwudire, H.U.C., Nkwocha, P.C., & Onyemerekeya, N.P. (2003). *Psychology of human learning*. Owerri: Versatile Publishers.
- Keefe, J. & Jenkins, J. (2004). *Eye on education, instruction and the learning environment* Larchmont, NY.
- Matthew, W. (2011). General principles of motivation. *Los Angeles Business Journal*, 12-15, <http://honolulu.hawaii.edu/intanet/committees/FacDevCom/guidebk/teachtip/motivate.htm>
- Meredith, G.M. (1969). Dimension of faculty of course evaluation. *Journal of Psychology*, 73, 27 and 32.
- Ngwoke, D. U. (2010). *School learning theories and application*. Enugu: Immaculate Publication Limited.
- Schunk, D.H. (2012). *Self-regulation theory and work motivation*. Hillsdale: N.J, Erlbaum.
- Tracy, B. (2005). *Maximum achievement*. New York: Simon Schuster.
- West African Examination Council (2014-2018). Annual Report (May-June). Lagos: Federal Ministry of Education.
- Ziegler, M., Schmukle, S., Egloff, B., & Buhner, M., (2015). Investigating measures of achievement motivation(s). *Journal of Individual Differences*, 3 (15-21).

IMPACT OF CIRCLE-TIME INSTRUCTIONAL APPROACH IN ENHANCING SOCIAL- EMOTIONAL SKILLS AMONG SECONDARY SCHOOL STUDENTS IN OWERRI

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Abstract

This study assessed the impact of circle time instructional approach to enhance social – emotional skills of secondary school students. This study was carried out in Alvan Ikoku Federal College of Education in Owerri Municipal Council Area of Imo State. Based on the purpose of the study, two research questions were raised and two hypotheses were formulated and tested at 0.05 level of significance. The study adopted the Quasi experimental research design specifically the pretest posttest group design. The population of the study comprised of 105 Pre-service teachers. A sample size of 105 Pre-service was used for the study involving 30 males and 75 females. The instrument for data collection was Social - emotional learning Questionnaire (SELQ). The reliability co-efficient(r) of 0.89 was obtained using test-retest method. Data collected were analyzed using Mean, standard deviation for the research questions and the hypotheses were tested using t-test statistical tool. The results showed that the implementation of circle time instructional approach is an effective method to develop social - emotional skills irrespective of gender. Based on the findings; Teachers should adopt circle time instructional approach in teaching secondary schools as to improve their understanding.

Key words: Circle time, Social- Emotional Skills and Assessment

Introduction

Education is identified as an effective tool that is capable of breaking the cycle of poverty and lays a strong foundation for socio-economic development of a nation. It is in this respect that governments all over the world are putting a lot of emphasis on educational development at all levels. Education as defined by Ikechukwu and Njoku (2012) is the process of teaching and learning usually at school, college or university. Embedded in this are the existence of teaching, learning and training activities meant to impact information, knowledge, skills and competences for individual and societal improvements and development. Education can be conceived as the development of the

cognitive, affective and psychomotor domain and abilities of an individual for optimal function and performance in the society. The individual is helped to maximize his mental, psychological and emotional abilities which will benefit him and the society he belongs. Hence, it can be said that the essence of education is the harmonious development of the individual's physical, mental, social and spiritual powers so that he or she is equipped to offer useful contribution. Therefore, education is the acquisition of knowledge which helps a person develop ability, skills, attitudes and other forms of behavior with positive value in the society (Okecha, 2008). It enhances the quality of an individual and enables him to build up his personality in such a way that he is able to play an effective role in the development of the society he belongs. Education is fundamental to personal and national development it plays a key role in the ability of a developing country to absorb modern technology and to develop the capacity for self-sustaining growth and development (Todaro and Smith, 2009). This is to say that education holds the key that unlocks a country's potentials towards national transformation and sustainable human national development. Despite that education have found to be key for sustainable development student social – emotional is low. Klyic and Edic (2005) observed learners have difficulties in developing the social- emotional skills required to effectively interact and maintain social awareness within the learning process. He went further to opined that for effective teaching and learning in schools there is need to enhance students social – emotional skills.

Zins & Ellias in Kylic and Edic (2005) define social - emotional learning as the process of acquiring and effectively applying the knowledge, attitudes, and skills necessary to recognize and manage emotions. Social - emotional learning curriculums focus on the development and enhancement of five core skills, including: self - awareness, social - awareness, self-management, relationship skills and responsible decision-making (Lantieri. 2009). These skills include the ability to recognize emotions within yourself and others, and use this emotional intelligence to regulate behavior and control impulses as well as to maintain reciprocal relationships. Self - awareness is the ability to recognize and assess one's emotions, interests, values and self-confidence. Social awareness; The ability to empathise, recognize and accept the perspective of others and appreciate similarities and differences among peers, family and the wider community. Self-management; The ability to regulate one's emotions, control one's impulses, manage stressful situations and display persistence. Relationship skills; The ability to establish and maintain reciprocal relationships, co-operate with others, and seek and provide help and assistance. Responsible decision making; The ability to consider ethical standards, safety, social norms and respect for others when making decisions. Therefore, to enhance the understanding of mathematics, learners must be more active in the classroom and must creatively acquire knowledge, especially in understanding and solving mathematical problems. Thus, one effective innovative technique to improve the teaching of mathematics is through circle time.

Circle time is a teaching strategy which allows a universal delivery for explicit teaching on various subjects Roffey (2009). In recent years, the world of education has adopted this strategy as it can be key to developing self-esteem and problem solving among the learners. Circle time is part of an overall whole school strategy for behavior

management. Circle time is a concept which has been devised and developed by Jenny Mosley. It is a strategy which encompasses a whole-school approach in enhancing self-esteem and building positive relationships within school communities. To be most effective, circle time needs to take place within the normal daily routine of the learning environment rather than be an occasional event (Roffey, 2009). Circle time provides a framework within which interactions may be enhanced (Roffey, 2009, Roffey & McCarthy, 2013). Circle time provides teachers with a student-centered learning where they can explicitly implement their learning curriculum. The teacher becomes the facilitator and a participant in the learning, steering the discussions and activities to suit the needs of the learners. Circle time is also called group time, refers to any time that a group of learners are sitting together for an activity involving everyone. The method is now in widespread use in schools across the country. In Nigeria many primary schools use the method regularly.

It is a special time to share finger plays, chants and rhymes, songs, play rhythm instruments, read a story, and participate in movement games, relaxation activities and play mathematical games. Circle time provides a time for listening, developing attention span, promoting oral communication, and learning new concepts and skills, it is a time for auditory memory, sensory experiences, socialization, and a time for fun. Circle time can be a complex, dynamic interaction among learners. Teachers have the power to make group time more effective and enjoyable for all involved. The circle helps to encourage the development of positive relationships, self-discipline, conflict resolution, assertive communication and democratic group processes alongside the skills of speaking, listening, observing, critical thinking and concentrating. Circle time offers a useful tool through which teachers can discuss issues related to self-esteem with students. It also provides a forum in which students can openly share their own feelings with others. This will allow the teacher to make more accurate assessments about students' levels of self-esteem. This is supported by Housego and Burns in Klyic and Edic (2005) who have argued that circle time can help teachers to engage in more effective formative assessment. White in Klyic and Edic (2005) has also argued that circle time can cultivate group identity and cohesion. Wooster and Carson in Klyic and Edic (2005) found that circle time activities led to improved self-concept and social interaction amongst a group of eight-year old and above. In addition, it has been argued that circle time can improve students' social skills (Wooster, Kantor in Jonathan, 2016) and extend "social networks introducing children to the pressures and demands of large group living" (Lown, 2002). Curry and Bromfield (2010) argue that circle time aims to develop the unique potential of each learner, of looking at their social and emotional growth and nurturing this within a caring group environment. Curry and Bromfield (2010) assert that circle time allows children to explore feelings and encourages them to believe that they are worthwhile people, thus developing self-esteem. Mosley in Carmel, Erika, Valeria, Audrey and Tracy (2013) shares this view, although she also emphasizes the value of circle time in fostering skills of group problem solving and group-decision making. This is an important point in the context of schools and classrooms, where groups of students may have an issue to solve, which is affecting their daily lives. Solutions can be shared among the group before a consensus is made regarding the best way to address the issue. Rothlein, Einspruch, and Goldberg in Klyic and Edic (2005) argue that circle time can improve intellectual

development and social development of students. However, these writers also argue that circle time can improve the physical motor development of learners. Many circle time games are practical and involve movement. This will develop the learners physically as well as socially and intellectually.

Kelly in Klyic and Edic (2005) also found that circle time brought about a marked positive change in behavior of children with emotional and behavior al difficulties. In circle time games and activities can be engaged in and are designed to promote trust, respect, empathy and understanding which offers participants the security and freedom to explore issues and find ways forward, it can be used to builds relationship and improve classroom behavior s, and to provide direction for future studies. Circle time can use to builds cooperative skills, turn-talking skills, and ability to express feelings irrespective of gender.

Gender is a specially constructed phenomenon that is brought about as society ascribes different roles, duties, behavior s, and mannerisms to the two sexes, (Mangvwat, 2006). It is a social connotation that has sound psychological background, and it is used to refer to specific cultural patterns of behavior that are attributed to human sexes. Gender relates to cultural attributes of both males and females (Akpochafo, 2009). Gender according to Lahey (2003) is a psychological experience of being a male or female. For instance, Singh (2010) opines that gender refers to a socio-cultural construct that connotes the differentiated roles and responsibilities of male and female in a particular society. Okoro (2008) thus observed that males and females show great differences in their interest and career choice. Gender differences in academic achievements of students have been examined over the years with conflicting results. For instance, it has been reported Peterson and Fennema in Unamba, Nwaneri & Ike (2019) that males out performed females in Mathematics during the school years. The findings of Okebukola (2002), Bamidele, Odusola and Dibu – Oyerinde (2006), Kolawole (2007), Aguele and Uhumaiah (2008) also found in their separate studies at various times that male students achieved significantly better than female students in different science subjects studied. Christine (2004), Umar (2008) and Amoo (2011) in their separate studies were of a different view that the performances of female students in science subjects studied were better than that of the male counterparts. In another conflicting view also, Abe (2004), Bichi (2004), McGreith and Lapointe (2005), Atadoga (2005), Lynn and Jaan (2008), Lawal (2009) and Olasehinde and Olatoye (2014) indicated that there were no significant differences between male and female students.

Researchers like Canney and Byrne (2006) investigated effect of circle time on social skills development among students with mild intellectual disability. Results indicated that those who had used Circle time most frequently had the best academic achievement. Doveston's (2007) investigated use of circle time in teaching and learning among pre-schools. Findings of the study showed significant difference between the learners taught using circle time and children taught using traditional approach. Researchers (Dix, Slee, Lawson, & Keeves, 2012; Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011; Payton, Weissberg, Durlak, Dymnicki, Taylor, Schellinger & Pachan, 2008) investigated academic achievement and social-emotional learning using

circle time . Result indicated that circle time promotes academic achievement, engagement, positive behavior and healthy relationships. Mosley (2009) examine the impact of using Circle time in teaching 300 children in 16 primary schools in Ireland. Result indicated positive academic and behavior outcomes, including improved concentration, listening and motivation, enhanced communication and collaboration, higher self-esteem and better behavior among the children. Another study with 20 early years' groups in the UK reported positive impact on both learning and behavior goals in preschool (Wood, 2001). A number of studies in secondary schools found similar positive effects for secondary school students, including enhanced self and social awareness and more positive attitudes towards learning (Aguis, 2011; Hennessey, 2007; Kulchy, 2009).

Other studies which made use of a multi-strategy approach, including CT, similarly reported improvements in emotional literacy and social skills such as listening and speaking (Coppock, 2007). Therefore, this study aims to assess whether social-emotional of students will be enhanced using circle time instructional approach. The main purpose of the study is to assess whether social-emotional skills of students will be enhanced using circle time instructional approach. Specifically, the study will seek to;

- i. Examine the mean level of students on social - emotional skills before and after implementing circle time instructional approach?
- ii. Examine the mean level of male and female students on social - emotional skills after implementing circle time instructional approach?

Research Questions

The following research questions guided the study:

1. What is the mean level of students on social - emotional skills before and after implementing circle time instructional approach?
2. What is the mean level of male and female students on social - emotional skills before and after implementing circle time instructional approach?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

HO₁. There is no significant difference in the mean level of students on social - emotional skills before and after circle time instructional approach.

HO₂. There is no significant difference in the mean level of male and female students social- emotional on skills after implementing circle time instructional approach.

Method

The research design for this study was Quasi-experimental pre-test- post-test group design. The population for this study was all the SS2 students comprising of 1105 in Alvan model Secondary school in Owerri Municipal Council. A sample of 105 was used (Intact class) consisting of 30 males and 75 females using simple random sampling technique (balloting). The instrument used for data collection is Social - emotional learning Questionnaire (SELQ). It was used to assess the participants' competencies in the five core areas of the social-emotional learning curriculum including self-awareness, social awareness, self-management, relationship skills, and responsible decision-making. This is a 10-item statements. It is structured based on four-point scale. The researchers adapted this instrument. The face and content validation were done by three experts in

measurement and evaluation. They were instructed to check for the language level, relevance, ambiguity, plausibility, vagueness and content coverage of the instruments for the study. Their advice, comments, recommendations and suggestions were used to modify instrument. Test-retest method was used to obtain the reliability of the instrument and estimated at 0.89 by using Pearson product moment correlation method. This was considered reliable enough to be used for the study. The researchers trained two (2) mathematics teachers in the school used in the study for a period of two weeks. The training exercise was based on the purpose of the study. They were trained to assess the students during the experimental exercise. Before the commencement of the experimental process the participants were pre-test to determine their cognitive backgrounds. The researchers prepared lesson notes and infused circle time on each of the topics during the training exercise. teachers introduce the topic (longitude and latitude) to the participants using prepared lesson notes with Instructional Materials and infuse social - emotional skills to teach the topic. They were allowed to pose problems and proffer solutions among themselves and compare solutions strategies within themselves. They interacted with the teachers when difficulties were countered. Teacher gave participants room for questions in areas not clear and later responded. The treatment period lasted for 3 weeks. Each session lasted for 1hr 20 minutes. After which a post-test was administered to the participants. The data generated was analyzed using mean and standard deviation for answering the research questions while t-test statistical tool was used to test the hypotheses at 0.05 level of significant.

Results

Research Question 1: What is the mean level of students on social - emotional skills before and after implementing circle time instructional approach

Table 1: Mean and Standard deviation on level of students social - emotional skills

Variables	N	Mean	SD	Mean Gain
Before (Pre-test)	105	42.34	1.05	
After (post-test)	105	53.56	2.21	11.22

Results in table 1 shows that the mean level of students on social - emotional skills before 42.34 with a standard deviation of 1.05 while the after the implementation circle time instructional approach the mean level was 53.56 with a standard deviation of 2.21 This implies that social - emotional skills of students was improved with a high mean gain of 11.22 after implementation of circle time instructional approach.

Research Question 2: What is the mean level of male and female students social - emotional skills on after implementing circle time instructional approach?

Table 2: Mean and standard deviation on gender social - emotional skills

GENDER	N	MEAN	SD	MEAN Gain
MALE	30	28.71	3.43	0.4
FEMALE	75	29.11	3.18	

Table2 shows that the mean level of male students on social –emotional skills at post-test is 28.71 with standard deviation of 3.43 and those of female students is 29.11 and a standard deviation of. Their mean gain is 0.4. The slight difference is in favour of female students.

Hypotheses testing

Ho₁: There is no significant difference in the mean level of students on social - emotional skills before and after implementing circle time instructional approach.

Tale 3: t-test analysis on pre-service teachers social - emotional skills

GROUP	N	MEAN	SD	Df	t-cal	t-tab	Decision
Pre-Test	105	42.34	1.05	103	2.05	1.96	Reject
Post -Test	105	53.56	2.21				HO

The result of the t-test presented in table 3 shows the calculated t-value of 2.05 is significant at ($P < 0.05$) the null hypothesis is rejected and the researchers concludes that there is significant difference in the mean level of students on social - emotional skills

Ho₂: There is no significant difference in the mean level of male and female students on social - emotional skills after implementing circle time instructional approach.

Table 4: t-test analysis on social - emotional skills

GENDER	N	MEAN	SD	t-cal	t-tab	Decision
MALE	30	28.71	3.43	1.06	1.96	Accept
FEMALE	75	29.11	3.18			HO

Discussion

The results of the study revealed that social –emotional skills of students were improved with a high mean gain of 11.22 after implementing circle time instructional approach. The finding in hypothesis one showed that there was a significant difference after implementing circle time instructional approach. This result is in accord with the findings of Doveston (2007) who investigated use of circle time in teaching and learning in pre-schools. Findings of the showed significant difference between the learners taught using circle time and children taught using traditional approach. Also, Dix, Slee, Lawson, & Keeves, (2012); Durlak et al, (2011); Payton et al., (2008) indicated that circle time promotes academic achievement, engagement, positive behavior and healthy relationships.

Also, there is no significant difference in the mean level on gender social-emotional skills. These results are in accord with the findings of Abe (2004), Bichi (2004), McGreith and Lapointe (2005), Atadoga (2005), Lynn and Jaan (2008), Lawal (2009) and Olasehinde and Olatoye (2014) indicated that there were no significant differences between male and female students in mathematics.

Conclusion

The results showed that the implementation of circle time instructional approach is an effective method to develop social –emotional skills irrespective of gender of the students.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Teachers should adopt circle time instructional approach in teaching and learning in schools as to improve their achievement of students.
2. Workshop and seminars should be organized for teachers as to be abreast with innovative approaches of using circle time instructional approach teaching.

References

- Abe, T. O. (2004). Comparative study of family type and sex difference on academic achievement of students in Mathematics. *Journal of Curriculum Studies Department*, 3,33-44.
- Aguele, I. I. & Agwugah, N. V. (2007). Female participation in Science, Technology and Mathematics (STM) Education in Nigeria and national development. *Journal of Social Science*, 15(2), 121-126.
- Aguis, L. (2011). Developing emotional literacy with secondary school girls with social, emotional and behavior al difficulties (Unpublished master's dissertation). Faculty of Education, University of Malta, Malta.
- Akpochafo, W. P. (2009). *Social Studies and Feminist Issues for teacher Education*. Benin City: Justice Jeco Press and Publishing Ltd.
- Amoo, E. D. (2011). Gender and academic performance in Nigerian universities: Economic implications. *International Journal and Research in Education*, 8(1), 159-172.
- Canney, C. & Byrne, A. (2006). Evaluating circle time as a support to social skills development: Reflections on a journey in school-based research. *British Journal of Special Education*, 33(1), 19-24.
- Carmel, C., Erika, F., Valeria, C., Audrey, C. & Tracy, G. (2014). Circle time for social and emotional learning in primary school. *Pastoral Care in Education: An International Journal of Personal, Social and Emotional Development*, 32(2), 116-130.
- Christine, P. (2004). Gender proves large factor in academic performance: *The pendulum* [Online]. March 11, edition.
- Coppock, V. (2007). It's good to talk! A multidimensional qualitative study of the effectiveness of emotional literacy work in schools. *Children & Society*, 21, 405-419.
- Curry, M. & Bromfield, C. (2010). *Circle Time*. Tamworth: Nasen Department for Education and Employment. Department for Education and Employment. (2000). *Educational Psychology Services (England): Current role, Good practice and*

Future directions. Annesley, Nottingham: Department for Education and Employment Publications.

- Dix, K. L., Slee, P. T., Lawson, M. J. & Keesee, J. P. (2012). Implementation quality of whole school mental health promotion and students' academic performance. *Child and Adolescent Mental Health*, 17, 45–51.
- Doveston, M. (2007). Developing capacity for social and emotional growth: An action research project. *Pastoral Care in Education*, 25, 46–54.
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D. & Schellinger, K. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82, 474–501.
- Hennessey, B. A. (2007). Promoting social competence in school-aged children: The effects of the open Circle Time program. *Journal of School Psychology*, 45, 349–360.
- Ihekwaba, C. N., Nkwocha, P. C. & Unamba, E., C. (2019). Enhancing Critical thinking skills and academic achievement of secondary school students in Mathematics using Problem based Learning Approach. *ASSEREN Journal of Education*, 4(1), 55-66.
- Ikechukwu, L. C. & Njoku, C. C. (2012). Education and Development Disconnect in Nigeria. A Case for Education for Sustainable Development (ESD) as the 21st Century Imperative for Nigeria's Sustainable Development and Global Competitiveness. *International Journal of Educational Research*, 1(1)1-12
- Jonathan, G. (2016). The Value of Circle Time as an Intervention Strategy. *Journal of Educational and Developmental Psychology*, 6, (2), 207-215.
- Kolawole, E. B. (2002). Sex differences in academic achievement in science subjects in Nigeria tertiary institution. *Research in Curriculum Studies*, 2, 168-173.
- Kulchy, L. (2009). Establishing a circle time group based upon boundary setting. Retrieved August 1, 2013, from <http://www.circle-time.co.uk/site/research/55>.
- Lantieri, L. (2009). *Cultivating emotional intelligence through social and emotional learning: Why it matters*. Retrieved from http://lindalantieri.org/documents/NationalGeographicarticleEIthroughSEL_Englishtranslation.pdf.
- Lawal, F. K. (2009). Acquisition of entrepreneurial skills through Biology Education and the role of Biology teacher. *Proceedings of the 50th Annual Conference of the Science Teachers Association of Nigeria (STAN)*.

- Lehey, H. (2003). *Discipline for self-control*. Upper Saddle River, NJ: Prentice hall.
- Lown, J. (2002). Circle time: The perceptions of teachers and pupils. *Educational Psychology in Practice*, 18(2), 93-102. <http://dx.doi.org/10.1080/02667360220144539>.
- Lynn, R. & Jaan, M. (2008), Science: Sex differences in attainment. *The Journal of Social, Political and Economic Studies*, 33(1), 101-124.
- Mangywat, C. (2006). Gender difference in cognition: A function of maturation role. *Science*, 193(190), 157-163.
- McCartney, K. & Lanphar, E. (2015). The Impact of Involvement in Circle Time on the Social and Emotional Awareness of Students Diagnosed with an Autism Spectrum Disorder," *TEACH COLLECTION of Christian Education*, 1(1), 56–67.
- Mosley, J. (2009). Circle time and socio-emotional competence in children and young people. In C. Cefai & P. Cooper (Eds.), *Promoting emotional education: engaging children and young people with social, emotional and behavior al difficulties* (pp. 119–130). London: Jessica Kingsley.
- Okebukola, O., O. (2002). *Beyond the stereotype to new trajectories in Science teaching*. Ibadan: Science Teachers Association of Nigeria, (Appendix A4).
- Okecha, S. (2008). Education. *Newswatch (Nigeria) Magazine*, October 6, P. 21-24.
- Okoro, O. N. (2008). Effect of emotional pictures on students, concept attainment in Primary Science. *Journal of Primary and Teachers' Education Association of Nigeria*, 9(2), 56-62.
- Olasehinde, K.J., & Olatoye, R. A. (2014). Comparison of male and female senior secondary school students' learning outcomes in science in Katsina State, Nigeria. *Mediterranean Journal of Social Science*, 5(2), 517- 523.
- Payton, J., Weissberg, R., P., Durlak, J., A., Dymnicki, A., B., Taylor, R., D., Schellinger, K., B., & Pachan, M. (2008). The positive impact of social and emotional learning for Kindergarten to eighth-grade students. Findings from three scientific reviews. Chicago, IL: CASEL.
- Roffey, S. (2009). Promoting social and emotional learning with games “it's fun and we learn things”. *Simulation & Gaming*, 4(5). Retrieved from <http://sag.sagepub.com.databases.avondale.edu.au/content/40/5/626.full.pdf+html>.
- Roffey, S., & McCarthy, F. (2013). Circle solutions: A philosophy and pedagogy for learning positive relationships. What promotes and inhibits sustainable outcomes.

Pastoral Care in Education, 5(1).

Singh, Y. K. (2010). *Dictionary of Education*. New Delhi: A. P. H Publishing Corporation.

Todaro, M., P. & Smith, S., C. (2009). *Economic Development Essex*, Pearson Education Limited.

Umar, A. Y. (2008). Comparative study of the enrolment and academic performance in Physics of male and female students in some selected secondary schools in Katsina State. *Nigerian Journal of Science and Educational Research*, 4(1), 131-139.

Unamba, E., C., Nwaneri, M., O. & Ike, I. (2019). Effect of Self-Regulated Learning Approach on Pre-service Teachers Achievement and Retention in Algebra. *ASSEREN Journal of Education*, 4(1), 33-44.

Wood, F. (2001) Can circle time in the foundation stage Support the early learning goals for personal, social and emotional development? (Unpublished dissertation). School of Education, University of Bristol, Bristol.

EVALUATION OF THE IMPLEMENTATION OF LITERATURE-IN-ENGLISH CURRICULUM IN THE SENIOR SECONDARY SCHOOLS IN IMO STATE

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Abstract

The study evaluates the implementation of Literature-in-English curriculum of the Senior Secondary Schools in Imo State. Based on the purpose of the study four research questions and four hypotheses guided the study. The population of the study consisted of all the 358 teachers of literature in English in Owerri Education Zone. The sample size of the study was made of 238 teachers involving 108 male teachers and 120 female teachers selected using simple random sampling technique. The instrument used for data collection was a researcher made questionnaire titled Evaluation of Literature in English Curriculum Implementation Questionnaire (ELECICQ). Face and content validity of the instrument was done by one expert in curriculum and instruction and two experts in measurement and evaluation. The internal reliability consistency of the items was established to be 0.79 using Cronbach alpha reliability method. Mean and standard deviation were used to analyze the research questions. The results showed that literature in English teachers use recommended textbooks, instructional methods, instructional materials and evaluation techniques in teaching literature in English lesson while there is difference in gender use of recommended instructional methods and evaluation techniques in teaching literature in English lesson. The major recommendations were A special monitoring unit should be set by both the federal and state government to ensure strict adherence to all the instructional strategies advocated for secondary school education literature in English curriculum.

Key words: Evaluation, Curriculum, Curriculum Implementation and Literature-in-English

Introduction

Evaluation is the systematic collection and analysis of data needed to make decisions. Bhola in Sithika (2019) says it is the process of determining the significances or worth, usually by careful appraisal and study. This implies that it is also the analysis and comparison of actual progress versus prior plans, oriented toward improving plans for future implementation. Ralph-Tyler in Sithika (2019) asserts that evaluation can be perceived as frequent decision-making and judgments which individual groups, institutions and governments pass on what affect their lives and those of others. According to him, such decisions or judgments are usually taken on the basis of experience, information and evidence. Oris (2005) defines evaluation as a process of finding out how far the learning experiences in relation to the content that have been developed and organized, actually produce the desired results. The process of evaluation will also involve

the identification of strengths and weaknesses of the curriculum plan. Ali (2014) is the lifeline to continual growth and accountability. it is one concept that is often difficult to be subjected to one acceptable definition. Different scholars have defined it in different ways depending on the meaning attached to it. Mkpa (2001) defines evaluation as a process of ascertaining the functionality of education programme and practices in a systematic manner. Akin (2013) in defines evaluation as a process of ascertaining the decision area of concern, selecting appropriate information and collecting and analyzing information in order to report summary data useful to decision makers in selecting among alternatives. From the above definitions, evaluation is a process of finding out the decision to be made and determining to what extent the educational objectives are actually being achieved.

Evaluation as an academic exercise is a long-standing tradition in education field. It is inevitable in all programmes where judgment has to be made. Educational Evaluation is broader in scope and more objective than educational measurement. It is the process of carefully appraising the individual form a variety of information giving device. Besides testing and other tools of measurement, evaluation seeks additional evidences form various sources of information supplementing each other: like interviews, questionnaires, anecdotal records, cumulative records, case conferences, mechanical or electronic recorders, case studies or projective techniques, etc. and the selection, through careful analysis of data, most pertinent to a wise just and comprehensive interpretation to make value judgment of the individual, or group under study. Educational evaluation is the continuous inspection of all available information concerning the student, teacher, educational programme and the teaching-learning process to ascertain the degree of change in students and form valid judgment about the students and the effectiveness of the programme. Value judgment on an observation, performance test or and data whether directly measured or inferred is called evaluation.

Ogomaka in Ubulom (2012) indicates that it is an integral part of instructional process where many writers stress the role of evaluation in education as an important aspect of teaching and learning process. This implies that evaluation is seen as a quality control mechanism, a means to decision-making, planning and advancement in all human endeavors. Asuru (1999) asserts that evaluation is a systematic process of passing value judgment as to worth of a thing, object, programme etc. It quantitatively describes the worth of a thing based on measurement data. While giving a broader definition, Nworgu (2002) states, "it is a process of seeking, obtaining and quantifying data with a view to making judgment about objectives, events or their characteristics in quantitative and qualitative forms or ways". The researcher wants to evaluate the implementation of Literature-in-English in secondary education in Nigeria.

Literature in English is a teaching a subject in the secondary curriculum not different from all other evaluation works. Its objectives cannot be neglected in a study like this. The objectives of Literature-in-English mapped out for Senior Secondary School by the Federal Government of Nigeria (2013) and West African Examination Council are as follow; (1) to give students a rich and well-rounded humanistic education through broadening the cultural horizon of students by exposing them to works that are varied in perspectives and yet universal in application (ii)To reinforce the English Language skills

already acquired by the students by showing them language in action in literary tests or works, (iii) To expose students to the beauty and potentials of language, (iv) To expose students to healthy human values and attributes, (v) To equip the students to develop the capacity for independent thoughts and judgments, (vi) To encourage attempts at creative writing as a means of understanding the creative process, and appreciating the principles of creativity, especially for those who can benefit from it, (vii) To develop the students' ability to respond appropriately and independently to literary works, (viii) To inculcate in the students the entertainment and instructive values of Literature as follow up to the literary skills learnt in the Junior Secondary School and (ix) To prepare the students' to pass Literature in the Senior Secondary School Certificate Examinations and the Joint Matriculation Examinations, and also to prepare them for work. Finally, it aims at achieving in individual, intellectual, socio-cultural, physical and moral reformation of character.

Emphasizing the importance of Literature in English, Ofondu (2011, p.23) states, "because literature reflects the language in use, it is necessary for the English Language teacher to discover and make use of these aspects of literature which will facilitate the effective teaching of English Language". In addition, Literature is used to teach English language as she goes further to enlist what Literature-in-English can do for the student as follows: Enlarge his reading vocabulary, Develop his ability to express himself adequately and effectively, Provides opportunity to use the correct patterns and structures of language, Helps him think in the language and learns to draw conclusions, Improves his pronunciation including sounds and phonetic patterns and Helps him in interpreting reading materials in relation to own experiences. Moody in Gertrude (2017) commenting on the essence of literature said that literature as a medium of communication, helps students to improve their vocabulary and helps them to gain familiarity with the structure of the language. He went further to state that literature consists of certain specialized forms, selections and collection of language and as such the study of literature is fundamentally a study of language. The rationale behind these objectives and importance of the subject is to improve the quality of life of the learner by empowering them to compete globally in an ever-changing world economy. For all these objectives to be achieved, the curriculum will need to be implemented by the teachers in the classroom.

Curriculum however, is a plan that consists of learning opportunities for a specific time frame and place, a tool that aims to bring about behavior -changes in students as a result of planned activities (Goodlad & Su in Okoro & Unamba, 2017). Tanner and Tanner in Izugba (2011) defined curriculum as a planned and guided learning experiences and intended learning outcomes, formulated through the systematic reconstruction of knowledge and experiences under the auspices of the school for the learner's continuous and willful growth in personal social competence. Similarly, curriculum can be defined as a plan for action or a written document that includes strategies for achieving desired goals or ends. It is a map of how to achieve the ,outputs of desired student performance, in which appropriate learning activities and assessments are suggested to make it more likely that students achieve the desired results (Wiggins & McTighe in Sithika, 2019). Curriculum can be seen as organized educational experiences which are planned and orderly carried out to the benefit of the learners, in particular, and the society in general. These

experiences are made up of ideas and decisions for learners' well-being. Thus, they recognize knowledge, attitudes, skills, values and so on otherwise called content (Okoro & Unamba, 2017).

Curriculum implementation refers to the execution or the putting into effect curriculum plans and programs (Esu & Umoren, 2009). Olofa (2003) sees curriculum implementation as valid actions (through participation, resources, provision of creating enabling environment) in the execution of planned program or translating theory into practice, with a view of yielding expected practice and what it looks like when actually used in school system. Curriculum implementation is bringing about change and hopefully improvement. According to Common Wealth of learners (2000), curriculum implementation takes place when the teacher's constructed syllabus, the teacher's personally, the teaching materials and the learning environment interact with the learner. The teacher is the most important element in any implementation of curriculum programme. It is the teacher who is maximally responsible for implementation of the education process of any level or stage. They adequately willingly implement the educational process in such a way that it brings about the desired educational development of the students (Belegali, 2011). The National Education Research and Development Council (NERDC, 2004) suggested a list of books to be used by both the teachers and learners. It further listed some instructional materials, instructional methods and evaluation techniques as shown below.

- **Instruction Materials:** Models, textbooks, Newspapers, Audio visuals, Computers, Overhead projectors, charts among other.
- **Instructional Methods:** Problem-solving, demonstration with activity method Use of example and illustration.
- **Evaluation techniques:** quiz, test, examination and assignment / homework

The classroom teacher according to Ogah (2005) is inevitably a key factor in the curriculum process. This is because the teachers harmonize the teaching materials using the various instructional methods and appropriate evaluation techniques to bring about learning in the pupils. Despite the commendable literature in English language curriculum objectives, suggested methods and materials for its teaching, and the services of workshops to enhance its effective implementation, achievement of instructional objectives remains the problem in the implementation of the curriculum. Today there are apparent issues bothering on how effective the implementation of literature in English Curriculum has been in terms school teachers utilize the recommended books, instructional materials, instruction methods and recommended evaluating techniques recommended by National Education Research and development Council (NERDC) for achievement of the objectives of literature in English language at the senior secondary school level.

Researchers like Yaxley (2001) conducted an evaluation of the implementation of Aboriginal Health Curriculum. Results showed that medical educators, Aboriginal Health Educators and registrars implement their health curriculum. Also, Odili and Asuru (2011) investigated the of impact evaluation of further mathematics curriculum in Nigeria. The results of the study revealed that teachers have good mode of evaluation practices in further mathematics classrooms. In a similar vein, Oris (2014) investigated Evaluation of the English Language Curriculum of the Nigeria Certificate in Education: A

Case Study of a College of Education. Result showed that the teaching and learning resources (physical and human) were found to be adequate. In Gertrude's (2017) investigation of the implementation of the basic school English curriculum, he found that teachers encounter so many pedagogical challenges and so are not able to implement the curriculum well. Similarly, Awofala, Oluwa and Fatade (2012) investigated the perception of primary and junior secondary mathematics teachers on the new 9-years basic education mathematics curriculum in Nigeria. Results showed that teacher's perception of the revised 9 years' basic education mathematics curriculum was high and their perception were neither gender sensitive nor academic qualification specific. However, teacher showed a high degree of ownership of the content of the new basic education mathematics curriculum despite their lack of necessary training in the principles of understanding the curriculum.

The main purpose of the study is to evaluate the implementation of literature – in English curriculum in secondary schools. Specifically, the purpose is to determine;

- i. Extent to which the recommended text books are being used by teachers in teaching literature – in English in secondary schools.
- ii. The extent to which the recommended instructional materials are being used by teachers in delivering literature- in English lessons in secondary schools.
- iii. Extent to which teachers are using the recommended instructional methods in teaching literature – in English in secondary schools.
- iv. The evaluation techniques used by teachers in evaluating students learning outcomes in literature in English in secondary schools.

Research Questions

The following research questions guided the study.

1. To what extent do secondary school teachers use the recommended literature in English textbooks while teaching the lesson?
2. To what extent do secondary school teachers use recommend instructional materials during instructional process in literature in English?
3. To what extent do secondary school teachers use recommended instructional methods while teaching literature in English lessons?
4. To what extent do secondary school teachers use recommended evaluation techniques to teach literature in English lessons?

Method

The design of the study is evaluative survey research design, evaluative research according to Nworgu (1991) is concerned with making decision relating to the value of worth of education, materials, methods programmes based on empirical data. The population of the study consisted of all 358 secondary School teachers in Imo State. A sample of (238) secondary school teachers were selected for the study using simple random sampling technique. The instrument used for data collection is Evaluation of Literature in English Curriculum Implementation Questionnaire (ELECIIQ) developed by researchers. It consists of two sections A and B. Section A comprise of demographic data of the respondents while section B comprises of the objectives of the study respectively (a) items on recommended textbook usage, (c) Items on recommended instructional materials

usage (d) items on recommended instructional methods usage, (e) usage of evaluation technique. The face and content of the validity of the instrument was done by one expert in curriculum and instruction and two measurement and evaluation experts. Their inputs were considered in restructuring the questionnaire. The internal reliability consistency of the items was established to be 0.79 using Cronbach alpha reliability method for ELECIQ, used for the study. The data generated was analyzed using descriptive statistic (mean and standard deviation) for the research questions. t-test statistical tools were used to test the hypotheses at 0.05 level of significant.

Results

Research Question 1: To what extent do secondary school teachers use the recommended literature in English textbooks while teaching the lesson?

Table 1: Mean and standard deviation on use of recommended literature in English textbooks

S/N	Items	Mean	S.D	Remark
1.	The lion and the jewel	5.24	0.68	Accepted
2.	Women of Owu	5.08	0.54	Accepted
3.	Suzi Bansi is dead by Athol Fugard	5.28	0.50	Accepted
4.	Hamlet by Shake Spear	4.52	0.43	Accepted
5.	The Sun on this Rubble	5.24	0.68	Accepted
6.	The Purple hibiscus	4.63	0.43	Accepted

Results in table 1 shows that all the items scored above the decision mean of 2.50. This implies that secondary school literature in English teachers use the recommended literature in English textbooks while teaching mathematics lesson.

Research Question two: To what extent do secondary school teachers use recommended instructional materials during instructional process in literature in English?

Table 2: Mean and standard deviation on recommended instructional materials

S/N	Items	Mean	S. D	Remark
7.	Flip chart			
8.	models	5.02	0.1	Accepted
9.	textbooks	5.43	0.1	Accepted
10.	Newspapers	5.02	0.1	Accepted
11.	Audio visuals	4.82	0.1	Accepted
12.	Computers	4.02	0.8	Accepted
13.	Overhead projectors	5.13	0.1	Accepted
14.	charts	4.83	0.6	Accepted

Results in table 2 shows that all the items scored above the decision mean of 2.50. This implies that secondary school teachers use recommended instructional materials while teaching literature in English lesson.

Research Question 3: To what extent do secondary school teachers use recommended instructional methods while teaching literature in English lesson

Table 3: Mean and standard deviation on use of instructional methods

S/N	Items	Mean	S. D	Remark
15.	Learning together method	5.01	0.1	Accepted
16.	Demonstration method	4.02	0.8	Accepted
17.	Activity based method	3.08	0.7	Accepted
18.	Use of examples and illustration	4.00	0.8	Accepted
19.	Questions and answers	5.63	1.0	Accepted
20.	Field trips	4.32	0.2	Accepted

Results in table 3 shows that all the items scored above 2.50. This implies that secondary school teachers use recommended instructional methods while teaching literature in English lessons.

Research Questions 4: To what extent do secondary school teachers use recommended evaluation techniques to teach literature in English lessons?

Table 4: Mean and standard deviation on recommended evaluation techniques.

S/N	Items	Mean	S. D	Remark
21.	Quiz	5.24	0.68	Accepted
22.	Test	4.63	0.43	Accepted
23.	Exam	5.34	0.63	Accepted
24.	Assignment/homework	5.24	0.68	Accepted

Results in table 4 shows that all the items scored above 2.50. This implies that secondary school teachers use recommended evaluation techniques to teach literature in English lessons.

Discussion

The results of the study revealed that secondary school literature in English teachers use the recommended literature in English text books, instructional materials, instructional methods and evaluation techniques to mathematics. These results agreed with the findings of Odili and Asuru (2011) investigated the impact evaluation of further mathematics curriculum in Nigeria. The results of the study revealed that teachers have good mode of evaluation practices in further mathematics classrooms. Also Awofala, Oluwa and Fatade (2012) investigated the perception of primary and junior secondary mathematics teachers on the new 9-years basic education mathematics curriculum in Nigeria. Results showed that teacher's perception of the revised 9 years' basic education mathematics curriculum was high and their perception were neither gender sensitive nor academic qualification specific. However, teacher showed a high degree of ownership of the content of the new basic education mathematics curriculum despite their lack of necessary training in the principles of understanding the curriculum.

Conclusion

The results conclude that literature in English teachers use recommended textbooks,

instructional methods instructional materials and evaluation techniques in teaching literature in English lesson while there is difference in gender use of recommended instructional methods and evaluation techniques in teaching literature in English lesson.

Recommendations

- (1) A special monitoring unit should be set by both the federal and state government to ensure strict adherence to all the instructional strategies advocated for secondary school education literature in English curriculum.
- (2) Government should through state ministry of Education board organize workshops on how effectively to use instruction and strategies in teaching literature in English.

References

- Asuru, V.A. (1999) *Measurement and Evaluation in Education and Psychology*. Port-Harcourt: Minsin (Nig. Ltd).
- Awofala, A., O. A., Oluwa, S., A. & Fatade, A., O. (2012). Teachers' perception of the new 9-year Education Mathematics Curriculum in Nigeria.
- Commonwealth of learning (2000). Curriculum theory, design and assessment from [Http://www.col.org/stamp/module13](http://www.col.org/stamp/module13) on 3/6/1016.
- Esu, E. & Umoren, J. (2009). *Curriculum Development in Nigeria for College and Universities* Calabar: Stitaith Prints.
- Federal Government of Nigeria. (2013). *National Policy on Education*. Abuja: NERC.
- Gertrude A., T. (2017). The Implementation of the Basic School English Curriculum: The Case of the Cape Coast Metropolis in Ghana. *Journal of Education and Practice*, 8(8), 166-175.
- Izuagba, A.C. (2011). *Teaching Economics and Government: Methods, Strategies and Techniques*. Owerri: Mega Atlas Projects Ltd.
- Mkpa, A. (2001) Optimization of Available Teaching and Learning Materials/Facilities. In: O. Nnolis & I. Sulaiman (Eds.), *Reassessing the Future Education in Nigeria*, Abuja: ETF Publication.
- Nigeria Educational Research and Development Council (2007). *The Think Tank of Education: The 9-year Basic Education Curriculum Structure*. Retrieved from <http://www.needsNigeria.org>.
- Nworgu, B.G. (2002) Theoretical and Empirical dimensions of Evaluation Research. *Journal of Educational Studies (IMSUJESO)*, 7(1), 45-52,
- Odill, G.A. & Asuru, V.A. (2011). Impact Evaluation of further Mathematics Curriculum in Nigeria *Educational Research and Review*,s 6(20), 997-1004.

- Ofondu, M.N. (2011). The role of English literature in the teaching of English as a second language in JS classes. Unpublished degree project UNN.
- Ogah, M.E.U. (2005). Trained and untrained teachers' perception of competencies for effective teaching of French: Implications for secondary school curriculum implementation. *Forum the Journal of WCCINigeria Chapter*, 5 (1,) 213-221.
- Okoro, I.F. & Unamba, E. C. (2017). Evaluation of the desired curriculum changes at the basic educational level: A case of implementation of primary school mathematics curriculum. *Nigerian Journal of Curriculum Studies* 24(2), 114-127.
- Okoye, N. N. (2004). Liked and disliked courses at the primary school level. *Issue in curriculum evaluation and vocational in Nigeria*, 1(1), 81-92.
- Olofa, M.A. (2003). Introduction to the Fundamentals of Curriculum Development: Calabar: Ushie Printing and Publishing Co. Ltd.
- Oris, T. (2014). An Evaluation of the English Language Curriculum of the Nigeria Certificate in Education: A Case Study of a College of Education. *Open Journal of Social Sciences*, 2014, 2, 69-79.
- Sithika, S. (2019). A Case Study Evaluation of Curriculum of English Subject for Lower Secondary School in Cambodia. *American International Journal of Social Science*, 8(1), 78-89.
- Ubulom, W. (2012). A Model for Evaluation of Business Education Programmes. *Developing Country Studies* 2(11), 152-158.
- Yaxley, L. (2001). Aboriginal Health: An evaluation of the implementation of curriculum, stage one <http://www.racgp.org.au/content/Navegation-men/Advocacy/Aboriginaland>.

USING GENERALIZABILITY THEORY TO ESTIMATE THE RELIABILITY OF TEACHING EFFECTIVENESS INSTRUMENT IN A SECONDARY SCHOOL IN ABIA STATE

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Abstract

There is lack in consensus in literature as regards the reliability of measures on students' evaluation of teacher effectiveness. Whereas some researchers argued that students are direct recipients of instruction and have the experience with the teachers' others opined that students lack knowledge of pedagogy. The study investigated the reliability of students' evaluation of teaching effectiveness using generalizability theory. Specifically, this study assessed the different sources of error seen in the measure and also determined the appropriate number of facet conditions required to gain a reliable measure. The participants comprised 79 SS2 and SS3 students of NINLAN demonstration secondary school, Abia State, purposively selected for the study. The instrument, Teaching Effectiveness Questionnaire (TEQ), which covers five dimensions of teacher effectiveness namely: knowledge of subject and organization, clear explanation, grading and evaluation, teaching methods, and interaction with students. Findings indicated that the person by item by occasion interaction effects accounted for the largest amount (31.85%) of variance followed by the item effect (28.10%) and item by occasion effect were negligible. D-study results showed that for dependable generalizability to the universe, four occasions of administration of the instrument is required with up to 7 – 10 items. They study concluded that TEQ assessed has inadequate reliability because it returned low G-coefficient. Based on the conclusion it was therefore, recommended that future researchers should replicate the study by increasing the number of occasions and items.

Key words: Generalizability theory, Dependability, Teaching Effectiveness

Introduction

One of the ways to monitor quality education is the output indicator which provides information on whether learning outcomes are improving as intended. Specifically, improvement in students' performance hinges on teacher quality and effectiveness. Having requisite qualification and certification do not always guarantee teaching effectiveness. Hence, need to evaluate teaching effectiveness. Teaching effectiveness is “the ability to improve student learning as measured by student gains on standardized tests” (Little, Goe & Bell, 2009, p.5). Mittal and Gera cited in Shevlin et al (2000) defined teaching effectiveness as teacher's ability to effect personal change and development in their students, their effectiveness in facilitating good academic work in their students and by students rating of their teachers. Students Evaluation of Teaching (SET) instruments

are commonly employed in assessing instructional quality. Alsarhan (2017) asserts that SET informs decisions about teacher effectiveness and provides feedback for teacher improvement used to monitor quality.

There are several methods in evaluating teaching effectiveness. These include: self-report instruments, observational techniques, rating scales etc. Students' evaluation continues to hold its primacy and most important method. It is considered a useful and meaningful feedback from students who have most contact with teachers and can supply information on what they think about their experiences in the class over time (Jimaa, 2013). There are controversy and contentions that student rating of teaching effectiveness yields invalid results because students are not knowledgeable about full context of teaching however, it is recommended that students rating should not be used in isolation of other methods of teacher evaluation (Little et al; 2009; Alok, 2011). Hence, need for reliable instrument for measuring teaching effectiveness.

Reliability is an important theoretical consideration of a measurement instrument. It can be seen as the extent to which a measurement instrument consistently gives the same results each time it is used in the same setting with the same type of subjects (Sullivan, 2011). Sullivan identified three types of reliability namely reliabilities of stability, internal consistency and equivalence. Stability measures the similarity of results yielded by an instrument in two administrations. Test-retest is a test of stability and is measured as correlation coefficient with Pearson r . Internal consistency evaluates if the average correlation between the construct items of an instrument measures the same characteristics in single administration. Internal consistency is tested with Cronbach Alpha for continuous variables and Kuder-Richardson for dichotomous variables. Finally, reliability of equivalence measures the extent to when the scores of an instrument from two or more rater agree. This is calculated using inter-rater reliability coefficient.

Earlier researchers estimated the reliability of various teacher evaluation instruments based on classical reliability theory. Alkharussi (2011) for instance, investigated the psychometric properties of the Teacher Assessment literacy Questionnaire (TALQ) for pre-service teachers. The items were analyzed using factor analysis to provide evidence of the construct validity and then test for internal consistency using Cronbach alpha and reliability co-efficient of 0.84 was obtained. Similarly, Alok (2011) developed and validated student evaluation of teaching instrument. Final version of the instrument was made of 18 items scored on 6-point Likert type scale. The construct validity was established using factor analysis, subsequently, test of reliability with Cronbach alpha yielded and impressive reliability coefficient of 0.95. Al Ansari, Strachan and Otoom (2017) developed a modified Student Evaluation of Teaching Questionnaire (SETQ) responded to by 298 medical students for purpose of evaluating 105 clinical teachers was analyzed for psychometric properties. Exploratory Factor Analysis (EFA) was conducted for evidence of construct validity and six factors were identified explaining 76.7% of total variance whereas Cronbach alpha reliability for the six factors on the student survey yield a coefficient of 0.94. In another development, Dodeen (2013) assessed the psychometric properties of students' evaluation of effective teaching instrument. The validity of the instrument was done using content and construct validity. Through factor analysis five

dimensions were identified. A Confirmatory Factor Analysis (CFA) was also used to cross-validate the instrument. Reliability of the instrument was tested for stability and internal consistency using test-retest and Cronbach alpha respectively. Reliability coefficients of 0.65 and 0.96 were obtained respectively.

Although the teaching evaluation instruments reviewed yielded high and adequate reliability coefficients which is indicative that they are stable overtime and internally reliable, the error term is from single source and undifferentiated meaning that other sources of measurement errors were not taken into consideration. This is a major limitation of classical reliability theory. However, another method for estimating reliability which uses analysis of variance (ANOVA) is generalizability theory which generates coefficient to qualify how multiple measurement errors due to different test items, subjects, raters, scenarios, among others, can be attributed to each potential factor (Sullivan, 2011).

Theoretically, Generalizability Theory (G. theory) can be seen as an extension of classical test theory which postulates that an observed score can be decomposed into a true score and undifferentiated random error. G. theory, pioneered by Cronbach, Rajaratnam, and Gleser in 1963, presented reliability as a degree to which one observation can be generalized to a universe of observations (Brown, 2005) and provided models that allow disentanglement of multiple sources error that contribute to the error term (Brennan, 2001). Generalizability theory is a statistical procedure that allows for the identification and estimation of different facets of a measurement which include and not limited to item, occasion, rate, test form (Webb & Shavelson cited in Hart, 2017). These facets of measurement are different sources of measurement errors which marks the superiority of G-theory over classical test theory. Therefore G. theory creates the dependability of measurement tools.

According to Brennan (2001), G-theory has a unique conceptual framework which are universes of admissible observations and Generalizability Studies (G. Studies) as well as, universes of generalization and Decision studies (D-studies). Expatiating on the uniqueness of G-theory Brennan (2003) asserted that:

Perhaps the most important and unique feature of generalizability theory is its conceptual framework, which focuses on certain types of studies and universe. A G (*generalizability*) study involves the collection of a sample data from a *universe of admissible observations* that consists of facets defined by an investigator. Typically, the principal result of a G study is a set of estimated random effects variance components for the universe of admissible observations. A D (*decision*) study provides estimates of universe score variance, error variances, certain indexes that are like reliability coefficients, and other statistics for a measurement procedure associated with an investigator specified *universe of generalization* (p.1).

Explicitly, G study involves ANOVA procedures to determine and interpret the variance components for facets of interest where person is the object of measurement. Following G-study is D-study which uses the variance components to estimate the effects of various design conditions on dependability. In D-study universe of generalization, which is the whole collection of possible observations to which the investigator wishes to generalize, must be specified.

Evidences from literature show that G-theory has been employed in assessing the reliability of different measurement instruments in different field. A study by Lafave and Butterwick (2014) tested reliability of Technical Skill Assessment Instrument (TSAI) using G-theory. Using a 2-facet, fully crossed design, 2 raters judged the performance of 29 participants on 2-ankle-tapping scenarios. Results revealed that tapping scenarios (67.84%) contributed highest variance whereas interaction among person, rater and scenarios (3.18%) contributed the lowest variance. However, rater and scenario (0.05%) interaction made no contribution to the variance component. D-study projected 4 scenarios as necessary to reliably measure athletes tapping skills. Yelboga (2012) investigated the dependability of job performance across task and raters. Results indicated that the person by task by rater interaction effects accounted for a largest amount (15.1%) of variance which was attributed to undifferentiated error term. Next to it was person main effect (6.7%) which was anticipated as persons were at different levels of performance. There was no variability in the task and task by person effects. D-study indicated that more raters were necessary to estimate the dependability of the job performance rating. Similarly, Hart (2017) examined the reliability of body composition measures using G-theory. A two-facet crossed design and mixed design were employed. The facets of interest were four methods used on two occasions on 38 persons. Findings indicated that, for the crossed design, large variance component was obtained for person effect (57.8%) with negligible variance for occasion and method. However, interaction effect between person and method (38.6%) was substantial. D-study result indicated that reliable body composition measurement requires minimum of three different methods result showed majority of variance due to person effect (98.5%) and each method with reliability score to a single trial. Kamis and Dogen (2018) compared the G and Phi coefficients estimated in D-studies in G-theory. Using crossed design, the investigation was on 120 students, six items and twelve raters. Actual cases for two, four and six raters followed by D-studies for other actual cases with different measurement conditions were conducted to obtain estimates of G and Phi coefficients. Findings revealed that G and Phi coefficient estimated in D-studies by increasing the number of raters were sometimes greater than those obtained in actual cases although they were smaller. However, it was concluded that a pattern may not always exist between the G and Phi coefficients in actual cases for same number of raters and those estimated in D-studies. Southam-Gerow, Bonifay, McLeod, Cox, Violante, Kendall and Weisz (2018) investigated generalizability and decision studies of a treatment adherence instrument on two samples of recording from two randomized controlled trials testing cognitive behavior therapy for youth anxiety in two different contexts: research and community. Two coders, 543 session recordings from 52 patients treated by 13 therapists were involved. The initial G-study demonstrated that context accounted for large variance. G- and D-studies for research context indicated that reliable cognitive behavior al therapy adherence studies require at

least 10 sessions per patient, assuming twelve patients per therapist and two coders.

Finally, G-theory has been used extensively in estimating reliability of various measurement instruments in health, sports, companies and education. The only study, Kamis and Dogan (2018), reviewed in education was not on student evaluation of teaching effectiveness. In addition, studies reviewed earlier on student evaluation of teaching effectiveness were based on classical reliability theory and samples were all drawn from tertiary institution. No literature available to the researcher applied G-theory to student evaluation of teaching effectiveness at all levels. The problem of the study therefore, was to estimate the reliability of a Teaching Effectiveness Questionnaire (TEQ) for secondary schools using G-Theory. The objectives was to examine the different sources of error involved in the Teaching Effectiveness Questionnaire (TEQ) measure among secondary school students and to estimate the appropriate number of facet conditions (item and occasion) required for a reliable measure.

Research Questions

Based on the objectives two research questions were posed as follows:

1. What are the different sources of error involved in the TEQ for measuring teaching effectiveness in secondary schools?
2. What are the appropriate number of facet conditions (item and occasion) required for a reliable TEQ for measuring teaching effectiveness in secondary schools?

Methods

The design adopted for the study was a two-facet fully crossed G-study designed ($P \times O \times I$) where P denotes the object of measurement (students), O denotes the number of occasions the instrument was administered, and I denotes the items.

Participants in the study comprised of 79 senior secondary two and three students purposively drawn from NINLAN Demonstration Secondary School, Aba, Abia State. These classes are taught by the same Mathematics teacher hence, they were requested to evaluate teaching effectiveness of their mathematics teacher. One school and one teacher were used because the information required was meant to be used to estimate the reliability of a teaching effectiveness instrument which basically, looked at teacher characteristics and no two teachers will have the same teaching characteristics.

Instrument for data collection was Teaching Effectiveness Questionnaire (TEQ) adapted from Students' Evaluation of Effective Teaching (SETs) developed by Dodeen (2013) for evaluation of university lecturers. SETs consisted of 29 items based on the five aspects of effective teaching which included essential characteristics of teacher performance, teacher qualities and behavior, and classroom environment. Given that the samples of the study were drawn from secondary school, TEQ comprised of 29 items which were adapted to suit them. TEQ was a 5-point rating scale with response categories and score weight as follows: Strongly Agree [4], Agree [3], Disagree [2], Strongly Disagree [1], and Undecided [0]. These items elicited information on knowledge of subject matter and organization (6 items); clear explanation (7 items); grading and evaluation (5 items); teaching methods (5 items); and interaction with students (6 items).

Procedure for data collection involved assigning identification numbers to the participants which they were asked to write on the questionnaire. During first administration, 87 students participated. The copies of the questionnaire were retrieved from the students on the spot. After two weeks, the instrument was re-administered. However, eight students were absent during the administration. Their responses in the first administration were removed and the remaining 79 students were used. The responses were scored and total scores of each participant on each of the five sub-scale of the questionnaire were matched.

Data collected were analyzed using statistical package for social sciences version 25 (SPSS – 25). Analysis of variances (ANOVA) procedures were used to estimate the variance of students' scores since each variance component tested may attribute to the error in measurement. The three main effects are persons (79), items (5 sub-scales), and occasions (2). The three two-way interactions between main effects (I x O, P x I, and P x O) and the three-way interaction effect (P x I x O) were confounded with random error as a function of the fully crossed G-study design. Relative and absolute error variances estimated were used to manually calculate generalizability coefficient and dependability coefficient using appropriate formula respectively (Faleye, 2018).

$$\rho^2 = \frac{\sigma_p^2}{\sigma_p^2 + \sigma_{Rel}^2}$$

and

$$\phi = \frac{\sigma_p^2}{\sigma_p^2 + \sigma_{Abs}^2}$$

A G-coefficient is interpreted in the same way as reliability coefficient in classical reliability theory. Therefore, 0.70 was benchmark for psychometric indication of a reliable instrument (Yelboga, 2012).

Results

Research Question 1: What are the different sources of error involved in the TEQ for measuring teaching effectiveness in secondary schools?

The variance components were estimate to examine different sources of error involved. Table 1 showed results for the two-facet G-study designed.

Table 1: *G-study and Variance Components for Two-Facet Crossed P x I x O fully Random Design*

Source	MS	Df	Estimated Variance Component	%
Person (P)	49.025	78	2.6263	13.52
Items (I)	884.891	4	5.4574	28.10
Occasion (O)	158.628	1	0.3254	1.67
P x I	10.744	312	2.2775	11.72
P x O	18.207	78	2.4036	12.37
I x O	18.068	4	0.1504	0.77
P x I x O	6.189	312	6.189	31.85

The estimated variance components as presented in Table 1 were obtained from the mean square using an algorithm as illustrated by Brennan (2001). The result revealed that the P x I x O effects accounted for the largest amount (31.85%) of variance. This is attributed to the undifferentiated error term. Next to it is the item effect (28.10%) followed by person effect (13.52%), P x O effect (12.37%) and P x I effect (11.72%). Variance components for both occasion effect and I x O effects were negligible.

Research Question 2: What are the appropriate number of facet conditions (item and occasion) required for a reliable TEQ for measuring teaching effectiveness in secondary schools?

The estimated variance components obtained at the G-study phase was used for D-study. D-study was carried out by using the observed number of items and occasions to determine hypothetical combination of facets needed to provide stable students evaluation of teaching effectiveness rating. G- and Dependability coefficients were computed for number of items (5 – 10) and occasions (2 – 4) while number of persons remained fixed at the actual value observed in the G-study. Acceptable generalizability was defined as a coefficient ≥ 70 . The result is as shown in Table 2.

Table 2: *D-Study for Various Combinations of Items and Occasions*

Items	Occasions					
	2		3		4	
	G-coefficient	D-coefficient	G-coefficient	D-coefficient	G-coefficient	D-coefficient
5	.54	.43	.61	.48	.66	.57
6	.56	.45	.63	.51	.68	.54
7	.57	.47	.65	.57	.70	.57
8	.58	.53	.66	.55	.71	.59
9	.58	.50	.67	.57	.72	.60
10	.60	.52	.68	.58	.73	.62

Table 2 revealed that all the coefficients for occasion two and three for every increase in number of items were less than the benchmark of 0.70. The most impactful facet of the study was number of occasions the instrument was administered. Acceptable G-

coefficient of .70 was achieved with seven items and four occasions up to 0.73 for ten items and four occasions. However, no D-coefficient reached minimum coefficient of .70.

Discussion

The G-study conducted considered two facets of interest namely items and occasions and it was found that the first finding of the study revealed that person by item by occasion interaction effect accounted for substantial amount of variance. This finding corroborates with Yelboga (2012) who attributed the large amount of variance of person by task by rater interaction to undifferentiated error term. Further, the finding of this study negated those of Lafave and Butterwick (2014) and Hart (2017) who in their separate studies found that scenarios and person main effects respectively, contributed highest variance component. The differing findings as compared with earlier studies could be because the studies were conducted in sports and health sectors respectively.

In the D-study, the generalizability coefficient found was 0.54 which was quite inadequate given the benchmark of 0.70 (Yelboga, 2012). At first the number of items was suspected to have contributed to the low reliability as five subscales were used as number of items. However, different contributions of number of items and occasions showed occasion to be most impactful facet. Low and slightly low generalizability coefficients were obtained for varying combinations of the facts until when item was seven and four. Southam-Gerow, et al., (2018) agreeing with this finding had low generalizability coefficients and concluded that the issue that appeared to have affected the G-coefficient was the residual error term. Kamis and Dogan (2018) found varying coefficient estimated in D-studies and they related the difference to sample size. A robust generalizability was obtained by Hart (2017). The low reliability obtained in the present study, could also be attributed to the controversy that students' rating of teaching effectiveness yields invalid results because of their lack of knowledge about full context of teaching (Little et al., 2009; Alok, 2011). D-study for the present study also indicated that four occasions and seven to ten items would be required for a more reliable instrument which will enable the decision maker to predict designs for future investigation.

Conclusion

Students' evaluation of teaching effectiveness is an important measure and requires a dependable instrument. Based on the finding of the present study it was concluded that TEQ assessed returned low G-coefficient hence inadequate reliability. For dependable generalizability to the universe, four occasions of administration of the instrument is required with up to 7 – 10 items.

Recommendation

It was recommended that future researchers should replicate the study by increasing the number of occasions and items.

References

- Alkharussi, H. (2011). Psychometric properties of the teacher assessment literacy questionnaire for pre-service teachers in Oman. *Procedia – Social and Behavior Science*, 29, 1614 – 1624. <https://www.sciencedirect.com>

- Alsarham, A. M. (2017). Alternative methods of estimating the degree of uncertainty in student ratings of teaching. *These and Dissertations*. 6939. <https://scholarsarchive.byu.edu/etd/6939>.
- Alok, K. (2011). Student evaluation of teaching: An Instrument and a development process. *International Journal of Teaching and Learning in Higher Education*, 23 (2), 226–235. <http://www.iset.org/ijthel>
- Ansari, A. A., Strachan, K; Hashim, S. & Otoom, S. (2017). Analysis of psychometric properties of the modified SETEQ tool in undergraduate medical education. *BMC Medical Education* 17 (56), 1–9. <https://doi.org/10.1186/512909>
- Brennan, R. L. (2001). *Generalizability theory*. Springer – Verlag.
- Brennan, R. L. (2003). Coefficient and Indices in generalizability theory. *A paper presented at the Annual Meeting of the American Statistical Association, San Francisco*.
- Brown, J. O. (2005). Generalizability and decision studies. *SHIKEN; JALT Testing and Evaluation SIG Newsletter*, 9 (1), 12 – 16.
- Dodeen, H. (2013). College students' evaluation of effectiveness teaching: Developing an instrument and assessing its psychometric properties. *Research in Higher Education Journal*, 21, 1 – 12.
- Faleye, B. A. (2018). Generalizability theory. A Workshop Notes Presented at Annual Conference of the Association for Educational Researchers and Evaluators of Nigeria (ASSEREN), Abuja
- Hart, P. D. (2017). Using generalizability theory to examine the reliability of body composition measurement. *SM J Biometrics Biostat*, 2 (4), 10 – 19. <https://smjournals.com>
- Jimaa, S. (2013). Students Rating: Is it a measure of an effective teaching or best guage of learning? *Procedia – Social and Behavior al Science*, 80, 30–34. Retrieved from www.sciencedirect.com
- Kamis, O. & Dogan, D. (2018). An investigation of reliability coefficients estimated for decision studies in generalizability theory. *Journal of Education and Learning*, 7 (4), 103–113. <https://files.eric.ed.gov>
- Lafave, M. R. & Butterwick, D. J. (2014). A generalizability study of athletic tapping using the technical skill assessment instrument. *Journal of Athletic Trang*, 49(3), 368–372. www.natajournals.org
- Little, O., Goe, L. & Bell, C. (2009). *A practical guide to evaluating teaching*

effectiveness. National Comprehensive Center for Teaching Quality.

- Mittal, S. & Gera. R. (2013). Students' evaluation of teaching effectiveness (SET): An SEM study in higher education in India. *International Journal of Business and Social Science*, 4(10), 1 – 10.
- Sullivan, G. M. (2011). A primer on the validity of assessment instruments. *Journal of Graduate Medical Education*. Editorial, 119 – 120. <https://www.ncbi.nlm.nih.gov>.
- Yelboga, A. (2012). Dependability of job performance rating according to generalizability theory. *Education and Science*, 37 (163), 158 – 164. <https://www.egitimvebilim.ted.org>
- Southam-Gerow, M. A., Bonifay, W., McLeod, B. C., Cox, J. R., Violante, S., Kendall, P. C., & Weisz, J. R. (2018). Generalizability and decision studies of a treatment adherence instrument. *Assessment* 0 (00), 1 – 13. Retrieved from <https://pdfs.semanticscholar.org>

LECTURERS' PERCEPTION OF THEIR EVALUATION BY STUDENTS IN TERTIARY INSTITUTIONS IN OSUN STATE, NIGERIA

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Abstract

This study examined the perception of lecturers in tertiary institutions in Osun State to the evaluation of academic staff performance by students, and determined the end-value of students' evaluation of lecturers. In order to achieve the set objectives, the study adopted survey research design. The population of the study comprised 3,287 lecturers in tertiary institutions in Osun State. A sample of 600 lecturers was selected by stratified random sampling technique. Six tertiary institutions, two each of University, Polytechnic and College of Education were purposively selected from tertiary institutions in Osun State based on ownership (federal and state government institutions). Of these, a total of 583 lecturers completed and returned the instrument used for the research. An adapted version of the instrument titled Lecturers Response to Students Evaluation of Teaching (LRSET) developed by Severino and Newman (2011) was used for this study. The instrument was divided in to three sections; section A consists of respondents' personal data, section B had 28 items relating to the perception of lecturers toward students' evaluation, while section C had 5 items on end-value of students' evaluation. Data collected were analyzed using percentages and mean. The results showed that 81.5% of the lecturers were favorably disposed towards their evaluation by students. The result also showed that lecturers largely agreed that the results of students' evaluation should not be used as part of staff review (79%), rather, its end- value should only serve as feedback to lecturers on their performance (54.34%). The study concluded that students' evaluation of lecturers was considered beneficial by lecturers in tertiary institutions in Osun State, but that the outcome of such evaluation should have no input to decisions on lecturers' promotion.

Key words: Perception, Lecturers, Evaluation, Teaching Effectiveness, End-value

Introduction

The quest for excellence in college and university teaching is a worldwide concern and institutions pay more and more attention to the quality of the pedagogy practiced in their classrooms and to assessing how effectively lecturers are teaching. Evaluating lecturer's teaching ability is one of the most difficult and contentious tasks faced by administrators. Although teaching ability is regarded one of the primary factors in promotion and tenure decisions, there is little agreement on how teaching effectiveness should be measured (Abdulkabir, 2006).

Even though most universities state that academic staff members are evaluated on their performance in three areas (i.e., research, teaching and service), many admit that rewards depend primarily on research and publications (Feldman, 2007). Using an evaluation system that rewards only one component of the job has resulted in criticism from students, legislators, and community groups as well as lecturer themselves. Due to the lack of satisfaction with the lecturer's reward system, many universities are attempting to change their current process (Gold, 2001). Evaluation should be a necessary part of any program that has maintenance of some standards in mind. Considering that the educational system of any nation drives the other systems, one would agree that quality assurance in the educational system is the key to national development. Iyamu and Aduwa, (2005) identified the benefits of student's evaluation of their lecturers teaching effectiveness to include: Excellence in teaching can be recognized and rewarded, it provides a platform for participation between lecturers and students, provision of the only direct and extensive information about lecturers teaching, stimulating an institution to consider its own goals and values, providing a platform for students' contribution in shaping the institutions educational goals. This should also include helping the lecturers to improve on their job of preparing the students for the work force as lecturers are expected to guide students to a successful future (Gardener, 2002).

In Nigeria, serious concern has been expressed by parents, lecturers, employers of labor and the entire society about the quality of graduates from Nigerian tertiary educational institutions, especially in universities. Several reasons have been suggested for the poor quality but perhaps, no consensus has been reached as to the effect of classroom interaction on the quality of our graduates. It is, however, no secret that most academic staff has compromised the teaching aspect, which is their primary responsibility, though in part, for the proverbial "publish or perish" syndrome. Consequently, teaching suffers and grades are awarded, whether students merit them or not. This seemingly lack of interest in what transpires in the classroom may be a serious factor in the quality of graduates produced. Certain kind of monitoring is therefore necessary if higher education is to achieve its objectives (Idaka & Joshua, 2009). It has been observed that the proper implementation of any curriculum at any level is a function of the quality of the teachers. Okebukola (2007) called for increased job commitment and the need to update the knowledge of the university teachers who are responsible for the implementation of the university curriculum. This implies, the teacher is the pivot on which the success of any educational programme hangs.

Though there is great desire for effective undergraduate teaching in our universities, recognition and evaluation of it have different applications for different institutions. While some shy away from formalizing the means by which a faculty teacher's teaching competence is judged, others are reluctant to give students a voice in the decisions that affect a faculty member's career (Iyamu & Aduwa, 2005). Many lecturers often argue the impossibility of quantitatively measuring effective teaching, yet they feel certain that they are effective teachers. Students' opinions are of particular importance because it represents an important addition to the data customarily used to judge faculty competence. It is the one source of direct and extensive observations of the way teachers carry out their daily and long-range tasks.

Student evaluation of instruction (SEI) is one of the popular approaches of lecturer evaluation. Other approaches include: classroom observation, peer evaluation, self-evaluation among others. Student evaluating their lecturers means that students as consumers of instruction are made to express their opinion and feeling concerning the effectiveness of the lecturer's instructional process and activities during the semester and the extent to which they benefited from that process. Although student evaluation has been engrossed in controversy, it is often used to improve instruction, enhance the professional growth of the academic staff and used as a measure of observing instructional performance of the lecturer from the student standpoint (Idaka & Joshua, 2009). The involvement of students in the evaluation of their lecturers' teaching effectiveness is seen as a practical demonstration of democracy in education. It is not in doubt that students are always able to provide a lot more information on their lecturers' teaching than would their Head of Department or Dean of Faculty. One of the ways to make lecturers become more serious with their teaching is to subject them to evaluation by the students. Appraisal of staff performance is crucial to staff development and elevation. So far in tertiary institutions in Osun State, students who are the direct beneficiaries of lecturers' service were not given the platform to provide a feedback on the performance of their lecturers. It is not certain how lecturers in tertiary institutions in Osun State will react to students' evaluation of their performance, hence the need for this study. The objectives of the study are to:

- (a) examine the perception of lecturers in tertiary institutions in Osun State to their evaluation by students.
- (b) determine the end-value of students' evaluation of lecturers.

Research Questions

The following questions were answered in the course of the study:

- (1) What is the perception of tertiary institution lecturers in Osun State to their evaluation by students?
- (2) What weight did lecturers ascribe to the end-values of students' evaluation of lecturers?
- (3) What are lecturers suggested end-values of students' evaluation of their lecturers?

Methodology

The study adopted survey design. In survey, data is collected from selected members of the study population for investigation. The collected data is then analyzed, and the result is used to generalized for the entire population. In this study, data were collected from a sample of lecturers in tertiary institutions in Osun State using an instrument titled "Perception of Lecturers toward Students' Evaluation" (PLTSE). The PLTSE elicit information on the feelings and reactions of lecturers to the different aspects of their teaching and supervision that students could evaluate, and the weight they are willing to attach to such evaluation.

The population of the study comprised 3,287 lecturers in tertiary institutions in Osun State. Samples of lecturers were selected by stratified random sampling technique using lecturer's rank and sex as strata. Six tertiary institutions, two each of University, Polytechnic and College of Education were purposively selected from tertiary institutions in Osun State based on ownership. Using a sample of 20% of the population in each

institution, 234 University lecturers were selected out of the 1,172 total population of the two universities, 196 Polytechnics lecturers were selected out of the 978 from the population of lecturers in the two Polytechnics while 153 lecturers were selected out of the 764 in the two Colleges of Education, all using proportional stratified sampling with rank, discipline and gender forming the strata. In all, a total of 583 lecturers out of 600 lecturers selected completed the instrument used for the study.

An adapted version of the instrument titled “Lecturers Response to Students Evaluation of Teaching” (LRSET) developed by Severino and Newman (2011) was used for this study. The instrument has three sections: section “A” sought demographic characteristics such as sex, cadre, institution, highest qualification, discipline, and years of experience while section “B” had 28 items that relate to perception of lecturers on students' evaluation. The adapted version which contained 28 items were moderated and reviewed by experts in Tests and Measurement. The response format is Likert-type, with five response modes of 'Strongly Agree', 'Agree', 'Disagree', 'Strongly Disagree', and 'Can't say'. The third section, section C, of the PLTSE has two parts. The first part has five items on end- value of students' evaluation. It is scored from 1 which is the lowest, to 5 which is the highest. The second part is open response requesting lecturers to indicate the use(s) which students' evaluation can serve in their institutions. The instrument was subjected to internal consistency reliability, which yielded a Cronbach Alpha reliability of 0.83. The pilot sample consisted of Lecturers in Ekiti State University, who were one part of the study.

The instruments were administered on the lecturers by the researchers. The researcher was assisted by the Heads of Departments in each institution who facilitated the completion and return of the instrument by the lecturers. The data collected were analyzed using Simple percentages.

Results

Research Question 1: What is the perception of tertiary institution lecturers in Osun State to their evaluation by students?

To answer this question, lecturers' responses to the items of Section B of ALTSE were scored and collated, and individual lecturer's total score on the scale was used in determining the disposition to students' evaluation of their lecturers. The group mean score and standard deviation on the ALTSE scale was ($\bar{X}$ = 105.56 and SD = 21.77) with minimum and maximum scores 16 and 140 respectively. Table 1 presents scores on the disposition of lecturers in tertiary institutions in Osun State to their evaluation by students.

Table 1: Lecturers' Disposition to their Evaluation by Students

Lecturers' Disposition	F	Percent
Positive	475	81.5
Negative	108	18.5
Total	583	100.0

Table 1 shows that 18.5% of the lecturers were negatively disposed to their evaluation by students while 81.5% indicated that they were positively disposed to their evaluation by students. Since most lecturers were positively disposed to their evaluation by students, it is important to identify the reasons for this. To this end, the frequency and hence percentage of responses to each item for the categories of the response format was found. Table 2 presents the results.

Table 2: Percentage ratings of items on students' evaluation of lecturers.

SN	Items	Agree	Disagree	Can't Say
1	Students are in a vantage position to evaluate their lecturers	91.4%	5.8%	2.8%
2	Students are mature enough to evaluate their lecturers	85.1%	11.3%	3.6%
3	Students possess adequate value- judgment to evaluate their lecturers	88.3%	6.2%	5.5%
4	Lecturers will be more prepared for their teaching if they know that their students will evaluate them	93.8%	4.1%	2.1%
5	Lecturers will be more punctual in class if they know that their students will evaluate them.	86.1%	12.2%	1.7%
6	Lecturer-student relationships will be improved if they are aware that their students will evaluate them.	95.2%	4.8%	0%
7	Student's evaluation will promote greater dedication of lecturers to their job	85.1%	14.9%	0%
8	Feedback on student's evaluation will help lecturers to improve their teaching.	82.7%	14.6%	2.7%
9	Lecturers are likely to devise innovative ways of teaching if they know their students will evaluate them.	80.2%	14.9%	4.9%
10	Awareness of students' evaluation will promote more transparency by other lecturers in assessing their students	77.4%	20.6%	2%
11	Results of students' evaluation can be used to improve students' learning	80.1%	18.4%	1.5%
12	Results of students' evaluation can be used to assess the professional needs of lecturers.	72.9%	22.6%	4.5%
13	Students' evaluation reports will engender self-reflection by lecturers	70.5%	27.1%	2.4%
14	Results of students' evaluation can be used for administrative decisions	90.6%	9.4%	0%
15	Results of students' evaluation will improve classroom instruction	79.1%	18.7%	2.2%
16	Students feedback can serve as an input in the annual review of lecturers	55.7%	44.3%	7.8%
17	Students' evaluation of lecturers is practiced worldwide, especially in developed countries	81.6%	10.6%	7.8%
18	Students' evaluation results can be used to determine the best lecturers in each department.	62.4%	20.4%	17.2%
19	Students' evaluation of lecturers should be carried out every semester	72.7%	27.3%	0%
20	Students may be malicious in their evaluation of lecturers	88.3%	11.6%	0.1%
21	Students may not be truthful in their evaluation	90.4%	9.6%	0%
22	Lecturers need to pay attention to student's opinion on their teaching	86.8%	13.2%	0%
23	Being the direct recipient of lecturer's teaching, it is appropriate that students' voices be heard	58.7%	22.8%	18.5%

24	Students' rating may be a good indicator of teaching effectiveness	70.7%	29.3%	0%
25	Students' evaluation may reflect how friendly a lecturer is rather than his/her teaching effectiveness	79.2%	20.8%	0%
26	Students' may reflect a dose of lecture's grade	84.0%	11.3%	4.7%
27	The privilege given to students to evaluate their lecturers may be abused by students	87.7%	12.3%	0%
28	On the long run, the opportunity of students to evaluate their lecturers may enhance character and personality	83.7%	16.3%	0%

Table 2 shows the percentage rating of items on students' evaluation of lecturers. It can be seen from the table that lecturers largely agreed that lecturers-students' relationships will be improved if they are aware that their students will evaluate them, they also agreed that lecturers will be more prepared for their teaching if they know that their student will evaluate them and also that student are in a vantage position to evaluate their lecturers with percentage values of 95.2%, 93.8%, and 91.4% respectively. However, the lecturers indicated that the items they were not too comfortable with were "student feedback to serve as input in the annual review of lecturers", "student rating may be a good indicator of teaching effectiveness", and "student evaluation should be carried out every semester with percentage values of 44.3%, 29.3%, and 27.3% respectively.

Research question 2: What weight did lecturers ascribe to the end values of students' evaluation of lecturers?

Since it is apparent that the lecturers are favorably disposed to their evaluation by the students, it is important to determine the end-value of this evaluation by the students and its possible use in the tertiary institutions. To do this, different weights are assigned to each of the items presumed to bring about the end-value of students' evaluation of their lecturers.

Table 3 presents the items and the percentage weight assigned to each of these items by the lecturers.

Table 3: End-value of Students' Evaluation of Lecturers

S/No	Items	No	Yes
1	As part of staff review for promotion	452(79%)	120(21.0%)
2	As part of decision on confirmation of appointment	452(79%)	120(21.0%)
3	No official use, only as personal feedback to staff	261(45.6%)	311(54.4%)
4	As part of decision on annual increment	149(26%)	423(74%)
5	As part of decision on commendation or warning	55 (9.6%)	517(90.4%)

From Table 3, weight 3,4 and 5 assigned to the items are categorized as positive disposition (YES) while weight 1 and 2 are categorized as negative dispositions (NO). It is observed that majority of the respondents (79%) believe that the end-value of the evaluation should not be part of the merit for promotion. 79% of the lecturers in the study disagreed with the evaluation result been used as part of decisions on confirmation of

appointments while (54.4%) accepted the notion of the result as only been used as a feedback to the lecturers. On the use of the evaluation result as part of decisions on annual increment, 74% of the lecturer agreed with this while 90.4% of the respondents believed that the result emanating from the evaluation should be included in decisions on commendation or warning of the faculty members in the institutions. Research question 3

What are lecturers' suggested end-values of students' evaluation of their lecturers?

Table 4: Lecturers' suggested use of students' evaluation of lecturers

	Suggested uses of Students' Evaluation of Lecturers	N	%	Rank
1	It enhances academic freedom and student teacher relationship	479	82.16	1
2	It also can improve the confidence of student on their lecturers	413	70.84	2
3	To indicate effectiveness of teaching	356	61.06	3
4	For self-evaluation of lecturers	311	53.34	4
5	To indicate effectiveness of teaching	234	40.14	5
6	It will enhance the performance appraisal of the lecturers	234	40.14	5
7	It is watchdog against academic freedom	205	35.16	7
8	To determine the quality of lecturers	203	34.82	8
9	It can enhance lecturers' preparedness for lecture and particularly in the class	115	19.73	9
10	It can serve as an avenue to reduce corruption in an institution	93	15.95	10

Table 4 shows that 82.16% of the lecturers suggested that students' evaluation of their lecturers can be used to enhance academic freedom and student teacher relationship. This made it the most suggested usage of students' evaluation of their lecturers, this was followed with the suggestion of 70.84% that it also can improve the confidence of student on their lecturers. A total of 61.06% suggested it could be used to indicate effectiveness of teaching while 53.34% suggested that it could be used for self-evaluation of lecturers. The least suggested use of students' evaluation of lecturers is it can serve as an avenue to reduce corruption in an institution as indicated by 15.95% of the lecturers.

Discussion of Findings

It was revealed from the study that 475 lecturers were positively disposed to their evaluation by students while 108 lecturers had negative attitude. This result agrees with the findings of Idiaka (2009) who also found that Nigerian lecturers indicate that they were positively disposed to their evaluation by students. Though Abdulraheem et al (2010) and Machingambi and Wadesany (2011) observed that most lecturers in Africa have not accepted students' evaluation of lecturers. This could probably be due to the fact that lecturers know it can help professionalism but there is the fear that if not properly used,

students can use it to witch-hunt lecturers who insisted on doing things properly. It was also found out that majority of the respondents believe that the end- value of the students' evaluation should not be part of the merit for promotion. Most of the lecturers in the study disagreed with the evaluation result been used as part of decisions on confirmation of appointments while few of the lecturers accepted the notion of the result as only been used as a feedback to the lecturers. This however agrees with the findings of Centra (2003) who found that the use of students' evaluation could be used as feedback to lecturers and also found that lecturers would teach more effectively when they received feedback from students and they feel more confident about their teaching.

Conclusion

In view of the findings arising from the analysis conducted in this study, it can be concluded that students' evaluation of lecturers was considered beneficial by lecturers in tertiary institution in Osun State. They however largely felt that the outcome of such evaluation would be better as feedback to lecturers than as part of the staff review process

Recommendation

From the results of the study, it can therefore be recommended that: (a) Student's evaluation of lecturer performance should be an important aspect of the assessment of lecturers in tertiary institutions in Osun State. (b) the result of student evaluation of lecturer's performance should be used for both formative and summative purposes. (c) the study should be replicated in tertiary institutions in other states.

References

- Abdulkabir, H. S. (2006). Strategies for Improving the Efficiency of Teachers in Jigawa state. Unpublished M. Ed. Thesis University of Nsukka
- AbdulRaheem, Y., AbdulRahman, A. U., & Olubode, O.C. (2010). University Teachers' Perception of the Effects of Students Evaluation of Teaching on Lecturers Instructional Practices in Nigeria. A paper presented at the first international conference of collaboration of Education Faculties in West Africa (CEFWA) held at University of Ilorin, Ilorin, Nigeria on 9th to 11th of February, 2010.
- Adebowale, W., & David, A. (1997). Student evaluation of teaching effectiveness: Nigerian investigation. *Higher Education*, 453- 463.
- Aleamoni, L.M. (1987) 'Typical faculty concerns about student evaluation of teaching', *New Directions for Teaching and Learning*, (31), pp 25-31
- Centra, J. (2003). Will Teachers Receive Higher Student Evaluations by Giving Higher Grades and Less Course Work? *Research in Higher Education* 44:5, 495-518.
- Feldman, K. A. (2007). Identifying exemplary teachers and teaching: Evidence from student ratings 1. *The Scholarship of Teaching and Learning in Higher Education: Research and Practice*. 93-143.

- Gardener Milton, M. B. (2002). Competent and the incompetent teacher. *Journal of Education*, 53- 65.
- Gold, R. (2001). Evaluation of Instruction *Educational Studies*, 31-42.
- Idiaka, H. Joshua, M. T. & Kristian, W. A. (2006). Attitudes of Academic Staff in Tertiary Educational Institution to Students Evaluation of Instructional (SEI). *International Journal of Scholarly Academic Intellectual*.
- Jackson, M. (1998). Teacher characteristics and teaching effectiveness. *Studies in Education*, 101-112
- Iyamu, E.O.S., & Aduwa, J, (2005). *Assessment of the Inquiry- Teaching Competences of Social Studies Teachers in Junior Secondary Schools in Edo State*. University of Benin, Benin.
- Machingambi, S., & Wadesango, N. (2011). University Lecturers' Perceptions of Students Evaluation of Their Instructional Practices. *Anthropologist*, 13(3): 167-174
- Severino, M. & Newman, W. (2011). University Lecturers Perception of Students Evaluation of their Instructional Practices: Walter Sisulu University, Center for Learning and Teaching Department, Republic of South Africa.

**COGNITIVE AND NON-COGNITIVE MEASURES AS PREDICTORS OF
SENIOR SECONDARY SCHOOL STUDENTS' PERFORMANCE IN CORE
SCIENCE SUBJECTS IN ONDO STATE, NIGERIA**

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Abstract

This paper examined the predictive influence of cognitive and non-cognitive measures on senior secondary school students' performance in core science subjects in Ondo state. Descriptive survey and ex-post facto research designs were adopted for the study. Through multistage and stratified random sampling techniques, a total of three hundred (300) SSSI students participated in the study. Instruments for data collection were Science Vocational Interest Inventory (SVII) and Science Aptitude Test (SAT). Using Correlational statistics and Regression Analysis, findings revealed that: (i) Significant relationships exist among cognitive, non-cognitive measures and students' performance in core science subjects (JSCE Basic Science and Technology and Performance: $r = 0.254$, $p < 0.05$; Science Aptitude and performance: $r = 0.77$, $p < 0.05$; Science Interest and performance: $r = 0.730$, $p < 0.05$). (ii) cognitive and non-cognitive measures jointly accounted for 70.0% of the total variance in students' performance in core science subjects ($R = 0.838$, $R^2 = 0.7002$, $F_{3,296} = 232.36$, $p < 0.05$) (iii) A cognitive measure (SAT) was the best predictor among the measures, it accounted for 53.4% of the total variance in students' performance ($\beta = 0.534$, $t = 12.896$, $p = 0.000 < 0.05$). It was concluded that combination of cognitive and non-cognitive measures is potent predictor of students' performance in core science subjects at upper secondary. It was therefore recommended among others that cognitive and non-cognitive measures should be juxtaposed in students' placement into various streams of upper secondary.

Keywords: Cognitive measures, non-cognitive measures, performance, core science subjects

Introduction

Education is indispensable in all facets of national development be it social, economic, and political. The development of any nation is a function of the kind of education given to its citizenry. The needs and values of any nation always dictate the educational policy of such a nation. With respect to Nigeria, the needs and values of the country could be seen in

her National Policy on Education (FRN, 2004) which made it explicitly clear that the need to train Nigerian citizens is to be able to manipulate their environment towards the development of the society. The policy further stated that education must result to the training of man to be able to understand the world and acquire appropriate skill, ability and competence in all areas of human endeavor in order to equip the individual to live comfortably within his society and contribute to the development of the society. For youths therefore to make meaningful contribution to the society, relevant education must be put in place. Thus, in Nigeria, the aims and objectives of education as enshrined in the National Policy on Education (FRN, 2004) includes:

- i. The training of the mind in the understanding of the world around, and
- ii. The acquisition of appropriate skills, abilities, and competence both mental and physical as equipment for the individual to live in and contribute to the development of the society.

To achieve these laudable goals and objectives, special emphasis was placed on the teaching and learning of science subjects at all strata of Nigerian education system. For instance, the purpose of introducing science education into the curriculum of senior secondary school students in Nigeria is to:

- i. cultivate inquiring, knowing and rational mind for the conduct of a good life and democracy;
- ii. produce scientists for national development;
- iii. provide service studies in technology and technological development; and
- iv. Provide knowledge and understanding of the complexity of the physical world, the forms, and the conduct of life.

In pursuance of the attainment of the stated goals of science education in Nigeria, the National Policy on Education (FRN, 2004) further stressed that a greater proportion of education expenditure should be devoted to science and technology and that universities and other levels of educational system will be required to pay greater attention to the development of scientific orientation. The policy emphatically stated that the ratio of Science to Liberal Art students in universities should be ratio 60:40.

Despite the importance of Science education to national development and seriousness on the part of the Nigerian government to pursue science education with substantial annual budget to science education, the trends of students' performance in core science subjects at SSCE in recent time in the country and Ondo State in particular has been poor. A decade analysis of students' performance in core science subjects of Physics, Chemistry and Biology in WASSCE in Ondo State is shown in Table 1:

Table 1: Trend of students' performance in science subjects at credit level in WASSCE May/June 2005-2014 in Ondo State.

Year	Subject	Enrollment	Total Male	Total Female	Total male with credit	Total Female with credit	% Male	% Female	% of students with credit
2005	BIO	32624	17631	14993	5068	3899	28.74	26.01	27.49
	CHM	11968	6981	4987	3276	2099	46.93	42.09	44.91
	PHY	11824	6966	4958	2818	1796	40.45	36.22	39.02
2006	BIO	31437	17085	14352	2592	5253	15.17	36.6	24.95
	CHM	11912	6949	4963	3852	1751	55.43	35.28	47.04
	PHY	11884	6941	4943	3852	2720	55.5	55.03	55.30
2007	BIO	33390	17984	15406	5593	4500	31.1	29.21	30.23
	CHM	12885	7232	5653	3392	2514	46.9	44.47	45.84
	PHY	12835	7215	5620	3765	2826	52.18	50.28	51.35
2008	BIO	34031	17921	16110	5335	4580	29.77	28.43	29.14
	CHM	13399	7411	5988	2849	2278	38.44	38.04	38.26
	PHY	13331	7372	5959	3446	2714	46.74	45.54	46.21
2009	BIO	55801	19311	16420	5429	4503	28.11	27.42	17.80
	BIO	14733	8055	6673	3928	3178	48.76	47.62	48.23
	CHM	14701	8042	6659	4570	3685	56.83	55.34	56.15
2010	PHY	43011	22604	20407	13432	12794	59.42	62.69	60.98
	BIO	17799	9404	8395	5467	4962	58.13	59.11	55.59
	CHM	17755	9397	8358	6671	5775	70.99	69.1	70.10
2011	BIO	2470	1250	1220	625	561	50	45.98	48.02
	CHM	1141	570	571	270	206	47.37	36.08	41.72
	PHY	1154	587	567	374	349	63.71	61.55	62.65
2012	BIO	2477	1276	1201	687	568	53.84	47.29	50.67
	CHM	918	553	365	221	212	39.96	58.08	47.17
	PHY	886	553	333	368	185	66.55	55.56	62.42
2013	BIO	2724	1386	1338	792	761	57.14	56.88	57.01
	CHM	1233	605	628	402	328	66.45	52.23	59.21
	PHY	1236	568	668	305	327	53.7	46.95	51.13
2014	BIO	20456	10270	10186	5900	5895	57.45	57.87	57.66
	CHM	17366	8788	8578	5293	4950	60.23	57.71	58.98
	PHY	17365	8789	8576	5261	4750	59.86	55.39	57.65

(Source: WAEC Office, Lagos cited in Duyilemi & Olusa, 2016)

An overview of Table 1 reveals that Ondo State students' performance in the core science subjects is fluctuating and poor. The poor performance cuts across both male and female students.

Mathematics serves as a pivotal tool in the understanding of science and technology. Hassan in Odual (2013) observed that Mathematics as a subject is universally acknowledged as an indispensable tool because of its wider applicability in all facets of human endeavor. Hassan cautioned that any nation seeking to develop a strong level of

science and technology must pay attention to the teaching and learning of Mathematics. In the realization of the importance of science to the technological development of any nation, the Nigerian government makes Mathematics a compulsory subject in the curriculum of primary and secondary schools (FRN, 2004). Mathematics also serves as a pre-requisite to the study of Engineering and Science related courses in tertiary institutions (JAMB Brochure, 2018). Like core science subjects, there has been a continuous poor performance of students in Mathematics in Senior School Certificate Examination in Nigeria and Ondo state in particular. The trend of students' performance in WASSCE in Ondo state between 2010 and 2015 is shown in Table 2.

Table 2: Performance of candidates in Mathematics in May/June WASSCE 2010-2015 in Ondo State

Year	% Credit and above (A1-C6)	% Fail (D7 - F9)
2010	17.7	82.3
2011	11.1	88.9
2012	9.5	90.5
2013	16.7	83.3
2014	28.3	71.7
2015	23.2	76.8

(Source: Ondo State Ministry of Education, Planning, Research & Statistics Department as cited in Fadiji, 2016)

From Table 2, the performance of students in WASSCE in Mathematics in Ondo State between 2010 and 2015 is far below average. The percentage of the students that obtained credits (C6-A1) in Mathematics in the stipulated time ranges between 9.5 and 28.3. Many factors have been identified by previous researchers as the cause of poor performance of students in core science subjects and mathematics. Some of these factors are: shortage of competent teachers to teach the subjects (Ajayi, 2004); lack of interest and commitment of Nigerian Science and Mathematics teachers to their profession (Olawajaju, 2009); gender and age factor (Ebere, 2006); parental educational background (Adeogun, 2009); poor understanding of the scientific concepts by the students (Erinosho, 2004); deficiencies in teachers' preparations (Ogunleye, 2008); inadequate provision of instructional resources that could facilitate science teaching and learning (Olagunju, 2010); students' negative attitudes to science subjects and scientists (King'aru, 2014).

Aptitude and interest are important variables also to reckon with in determining students' performance in science subjects. To get desirable success in a given activity, a person must have both an aptitude for activity and interest in it (Mangal, 2007). Traxler in Mangal (2007) described aptitude as a condition, a quality or a set of qualities which is an indicator of the probable extent to which individuals will be able to acquire under suitable training, some knowledge, skill or components of knowledge, understanding and skill, such as ability to contribute to arts, or music, mechanical ability, mathematical ability or to read and speak a foreign language. Apart from aptitude, interest is also another important factor to engage in any activity or course.

Crow and Crow in Mangal (2007) described interest as the inspiring force that drives people to attend to other people, thing, or an activity, or the effective experience that has been stimulated by the activity itself. Interest can be the cause of an activity and the result of participation in the activity. Thus, interest may be referred to as the key factor and a driving force that helps us in paying attention as well as remaining engaged in activities. Aptitude has future reference and tries to predict the degree of attainment or success of an individual in an area or activity after adequate training.

Interests and aptitudes should not be seen as the same thing (Mangal, 2007). A person may be interested in a particular activity, job or training, but may or may not have aptitude for that activity, job or training. Interest shown in a particular occupation or course of study could be attributed to some other factors like ambition of the parents, probability of getting a job, provision of stipend or financial help, the prestige associated with the work rather than the personal aptitude. In the same vein, a person may have aptitude for certain activity but may not have interest in the activity. Therefore, Mangal cautioned that a guidance or selection programme must give due weightage to the measurement of aptitude as well as of interest. Both are essential for the prediction of the success of an individual in a given activity – job or course of instruction.

The researchers observe that a cognitive measure like Junior School Certificate Examination (JSCE) is the only measure often used by many secondary schools in Nigeria and in Ondo state in particular to select students into various streams of upper secondary school level. In the selection process, many schools select their students that performed well in JSCE Basic Science and Technology into the science stream of upper secondary. Many students that are not doing well in the Basic Science and Technology may be advised to go into Art or Humanity arms of the upper secondary. The motive behind the schools' selection criteria is that students that have exemplary performance in Basic Science and Technology at lower secondary should be able to perform well in core science subjects of Physics, Chemistry and Biology at the upper secondary. The interest and aptitude of the students seems not always considered. Due regard is always given to cognitive ability (like achievement) at the expense of other cognitive ability (like aptitude) and non-cognitive ability. With this practice in place now for some time in Nigeria and Ondo State in particular, students have been performing poorly in core science subjects at SSCE. Whereas, literature revealed that interest and aptitude are essential for the prediction of success of an individual in a given job or course. Hence, could combination of cognitive and non-cognitive measures be better predictors of students' achievement in core science subjects at the upper secondary school level?

The main thrust of this paper is to examine the predictive influence of cognitive and non-cognitive measures on students' academic performance in core science subjects at upper secondary. Specifically, the study sought to examine the predictive influence of cognitive measures (JSCE in Basic Science and Technology, Science Aptitude Test) non-cognitive measure (Science Interest Inventory) on students' performance in core science subjects (Physics, Chemistry and Biology) at upper secondary school level.

The following research questions were raised to guide the study:

1. What patterns of relationships do exist among students' cognitive, non-cognitive

- measures and performance in core science subjects at upper secondary?
2. What is the combined contribution of cognitive and non-cognitive measures to the prediction of students' performance in core science subjects at upper secondary?
 3. What is the individual contribution of cognitive and non-cognitive measures to the prediction of students' performance in core science subjects at upper secondary?

Methods

This study made use of descriptive survey and ex-post facto research designs. The population of study comprised the entire public (SSS1) science students in 2017/2018 academic session in Ondo State. Three hundred SSS1 science students were randomly selected from the entire public secondary schools in the three senatorial districts of the state using multistage and stratified random sampling techniques. The state has 18 local government area councils with six local government area councils in each senatorial district. One Local Government Area was randomly selected from each district and five schools each were selected from each Local Government Area for the study using the simple random sampling. Twenty science students were finally selected from each of the fifteen secondary schools selected. The instruments for data collection were Science Aptitude Test (SAT) and Science Vocational Interest Inventory (SVII). The SAT was personally developed by the researchers. SAT contains 48 items. It covered seven major parts of scientific aptitudes (scientific interest, experimental bent, ability to reason, ability to interpret, ability to see relationship, verbal comprehension and interpretation and logical conclusion). The initial draft of the SAT was given to experts in science education and colleagues in test and measurement for comments and suggestions before the final draft was administered. Kuder-Richardson 20 was used to estimate the reliability of the SAT. The reliability coefficient obtained was 0.62. The SVII was adapted from the items on mechanical, computational, scientific and outdoor aspects of the SVII developed by Bakare (1977) to collect data on vocational interest scores. Bakare SVII consisted of a total of 100 items and structured in the five-point Likert scales ranging from very much like to very much dislike. The items were reduced to 40 items that is 10 items each in the four areas of interest (outdoor, mechanical, computational and scientific). The reliability of the adapted version of the instrument was 0.75 estimated using Cronbach Alpha method. A proforma was designed to collect the SSSI students' scores in Basic Science and Technology and their third term examination scores in Physics, Chemistry and Biology at SSS1. The SAT and SVII were administered on the sampled students at first term in SSS1. These yielded science aptitude and vocational interest scores respectively. JSCE Basic Science and Technology and SAT yielded scores for cognitive ability. SVII yielded scores for non-cognitive ability while SSS1 third term examination yielded scores in core science subjects. Data obtained from these cognitive and non-cognitive measures were analyzed using correlation matrix and Regression Analysis.

Results

Research Question 1: What patterns of relationships do exist among students' scores in cognitive, non-cognitive measures and average performance in core science subjects at upper secondary?

To answer this research question, scores of students in JSCE Basic Science and Technology, SAT, SVII, and average performance in core science subjects of Physics,

Chemistry and Biology were obtained and subjected to correlational analysis. The result is as shown in Table 3.

Table 3: Correlation matrix showing relationships among scores of students in JSCE Basic Science and Technology, Science Aptitude Test, Science Vocational Interest Inventory, and average performance in core science subjects.

JSCE BST	1			
Aptitude	0.322**	1		
Interest	0.291**	0.626**	1	
Performance	0.254**	0.777**	0.730**	1
	JSCE BST	Aptitude	Interest	Performance

From Table 3, it can be observed that there is a significant and low positive relationship between cognitive measure and students' performance in core science subjects, there is also a significant and high positive relationship between non-cognitive measures and students' performance in core science subjects (JSCE Basic Science and Technology and Performance: $r = 0.254$, $p < 0.05$; Science aptitude and performance in core science subjects: $r = 0.77$, $p < 0.05$; Science interest and performance in core science subjects: $r = 0.730$, $p < 0.05$). Science aptitude and performance in core science subjects at upper secondary has the highest correlation coefficient.

Research Question 2: What is the combined contribution of cognitive and non-cognitive measures to the prediction of students' performance in core science subjects at upper secondary?

To answer this research question, scores of students in JSCE Basic Science and Technology, Science Aptitude Test scores, Science Vocational Interest Inventory scores, and average scores in core science subjects of Physics, Chemistry and Biology at upper secondary were obtained and subjected to linear regression. The result is as shown in Table 4

Table 4: Regression analysis showing the combined contribution of cognitive and non-cognitive measures to the prediction of students' performance in core science subjects

R = 0.838 R square = 0.7002 Adjusted R square = 0.699 Standard Error of the Estimate					
ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	11939.724	3	3979.908	232.36	.000
Residual	5069.943	296	17.128		
Total	17009.667	299			

Independent variables = Science Aptitude Test scores, Science Vocational Interest Inventory scores, JSCE Basic Science and Technology scores. Dependent variable = Average performance in core science subjects

Table 4 revealed that there was a strong and positive relationship among scores obtained from cognitive measures (SAT, JSCE Basic Science and Technology), Non-cognitive measure (SVII) and average scores in core science subjects ($R = 0.838$). Scores from both cognitive and non-cognitive measures made significant contribution to the prediction of performance in core science subjects. The SAT, SVII, and JSCE Basic Science and Technology accounted for 70.0% of the total variance in students' performance in core science subjects ($R=0.838$, $R\text{ square} = 0.7002$, Adjusted $R\text{ square} = 0.699$, $F_{3,296} = 232.36$, $p<0.05$). By implication, 30% of the factors that accounted for students' performance in core science subjects are not explained in this study.

Research Question 3: What is the individual contribution of cognitive and non-cognitive Measures to the prediction of students' performance in core science subjects at upper secondary?

To answer this research question, scores of students in JSCE Basic Science and Technology, SAT, SVII, and their average scores in core science subjects of Physics, Chemistry and Biology were obtained and subjected to linear regression. The result is as shown in Table 5

Table 5: Regression analysis showing relative contribution of cognitive and non-cognitive measures to the prediction of students' performance in core science subjects

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	β	Std Error	B		
(Constant)	27.93	1.180		23.665	.000
JSCE (BST)	-0.019	0.018	-0.036	-1.074	.234
Aptitude	0.103	0.008	0.534	12.896	.000
Interest	0.414	0.042	0.406	9.894	.000

Dependent variable = Performance in core science subjects

From Table 5, two of the independent variables (Science Aptitude Test Inventory and Science Interest Inventory) made significant contribution to the prediction of students' performance in the core science subjects. JSCE Basic Science and Technology did not make significant contribution to the prediction of students' performance in core science subjects. Specifically, Science Aptitude Test was the best predictor of students' performance in core science subjects. It accounted for 53.4% of the total variance in students' performance in core science subjects ($\beta = 0.534$, $t = 12.896$, $p = 0.000 < 0.05$). This was closely followed by Science Vocational Interest Inventory. It also accounted for 40.6% of the total variance in core science subjects' performance at upper secondary ($\beta = 0.406$, $t = 9.894$, $p = 0.000 < 0.05$). JSCE Basic Science and Technology was the least predictor. Although it accounted for 3.6% of the students' performance in core science subjects at upper secondary, it was not significant at 0.05 level of significance. ($\beta = 0.036$, t

= 1.074, $p = 0.234 > 0.05$)

Discussion of Findings

Finding from research question one showed that there was a significant and positive relationship among students' scores in cognitive, non-cognitive measures and performance in core science subjects at upper secondary. This finding is in consonance with the earlier findings of Ebuoh (2014) that established a significant relationship between achievement and aptitude test scores; Ezike (2018) that established a significant relationship between students' academic interest and achievement in science subjects; and Enemarie, Ajayi and Ogeba (2019) that reported positive and significant relationship between Basic Science and Technology and Science education at SSCE. The findings imply that achievement in Basic Science and Technology, Science interest and scientific aptitude are pre-requisites for competence in Core science subjects at upper secondary school level.

The finding for research question 2 showed that combination of scores from both cognitive and non-cognitive measures made significant prediction of performance in core science subjects. Scores in Science Aptitude Test, Science Vocational Interest Inventory, and achievement in JSCE Basic Science and Technology accounted for large proportion of the total variance in students' performance in core science subjects at upper secondary school level. This finding is in consonance with the finding of Adebayo (2008) in which the combination of cognitive measure (high school GPA) and non-cognitive measures (realistic self-appraisal and understanding and coping with racism) accounted for 21% of the total variance in the first semester GPA of conditionally admitted freshmen. Using stepwise regression analysis, Adebayo reported that a cognitive measure only accounted for 14%, combination of a cognitive and a non-cognitive measure accounted for 14%, a combination of a cognitive and two non-cognitive measures accounted for 21% of the total variance in students' academic achievement. The combination of cognitive and non-cognitive measures (JSCE Basic Science and Technology, Science Aptitude Test, Science Interest Inventory) in this study also accounted for 70% of the total variance in core science achievements at upper secondary school level. The combined contribution of cognitive and non-cognitive measures in this study accounted for more variance in students' academic performance than the combined contribution of cognitive and non-cognitive measures from Adebayo (2008) study. Perhaps, the reason why independent variables in this study contributed more to dependent variable than Adebayo's study could be as a result of two cognitive measures and one non-cognitive measure used. Adebayo made use of a cognitive measure and two non-cognitive measures. The introduction of Science Aptitude Test (which is the best predictor) of all the three measures could also be another reason why combination of cognitive and non-cognitive measures in this study contributed more to students' academic performance than Adebayo's study.

Finding from research question 3 indicated that SAT was the best predictor of students' performance in core science subjects. This was followed by SVII. JSCE Basic Science and Technology was the least predictor; it did not make significant contribution to the prediction of students' performance in core science subjects at the upper secondary level. The finding corroborates the finding of Suleiman and Daniel (2014) in which an aptitude

test (Post UTME) was the best predictor of achievement in Nigerian universities among the cognitive and non-cognitive measures investigated. For Science Aptitude Test to be the best predictor of students' achievement in core science subjects at upper secondary school level in this study is not coming as a surprise. Aptitude is an individual's propensity to succeed in future with training. For Science Vocational Interest Inventory also to make significant contribution to students' achievement in core science subjects is also a clear testimony that whatever career or vocation individuals develop interest, definitely he or she will strive to succeed in such vocation or career. For achievement test (Basic Science and Technology) not to make significant contribution to students' performance in core science subjects at upper secondary in this study could be attributed to many factors. The psychometric properties of the achievement test could cause the variation. Besides, the way Basic Science and Technology are being taught in junior secondary schools nowadays could also cause variation. For instance, teachers most of the time placed premium on teaching Biology component of the Basic Science and Technology. The Physics and Chemistry components are relegated to the background. Definitely it will affect students' performance in core science subjects at the upper secondary level.

Conclusion

The study examined the predictive influence of cognitive and non-cognitive measures on senior secondary school students' performance in core science subjects at the upper secondary school level in Ondo State, Nigeria. It was discovered that although, a cognitive measure (SAT) and non-cognitive measure (SVII) made significant relative contribution to the prediction of students' performance in core science subjects at the upper secondary, but the joint contribution of both the cognitive and non-cognitive measures investigated was the potent predictor of performance at later period. A cognitive measure only (like JSCE Basic Science and Technology) which is achievement test in this study singularly did not make significant contribution to the prediction of students' performance in core science subjects at the upper secondary school level.

Recommendations

Based on the findings of this study, the following recommendations were made to enhance better placement of secondary school students into the appropriate stream of the upper secondary for better performance.

1. Cognitive and non-cognitive measures must be juxtaposed in selecting students to the various streams of upper secondary school level. Adequate weightage must be given to each by the school principals and counsellors.
2. Majority of the teachers and counsellors in secondary schools are conversant with the achievement test which is just a cognitive measure. The secondary school teachers and counsellors should also be trained in the construction and usage of other forms of cognitive measures like Aptitude test.
3. Teachers and counsellors should also be trained on the application of non-cognitive measures before taking vocational or career decisions on students.
4. Future researches should be conducted on other non-cognitive measures like attitude and motivation.

References

- Adebayo, B. (2008). Cognitive and non-cognitive factors affecting the academic performance and retention of conditionally admitted freshmen. *Journal of College Admission*, 15-21. Downloaded 15th March, 2021 from www.NACACNET.ORG.
- Adeogun, O. B. (2009). The roles of socio-economic variables on students' achievement in senior secondary school Chemistry in Ogun State, Nigeria. *Journal of Science Teachers' Association of Nigeria*, 20-24.
- Ajayi, N. (2004). A reflection of the Nigeria experience. *Education for Today: Journal of the Federal Ministry of Education*, 3(1), 9-12.
- Duyilemi, A. N., & Olusa, O. L. (2016). Gender and performance in science subjects in secondary schools in Ondo state, Nigeria. *Journal of Science and Technology*, 1(1), 160-173.
- Ebere, L. (2006). Breaking gender barriers on achievement in STM. Using hands-on, minds-science: Implication for supply of resources. Science Teachers Association of Nigeria proceeding 47th Annual Conference Education in Nigeria. A research project submitted to FAWE, Nairobi, Kenya.
- Ebuoh, C. N. (2014). Aptitude test as co-relate of students' performance in achievement tests in senior secondary school Biology. *Journal of Education and Practice*, 5(29), 11-15.
- Enemarie, V., Ajayi, V. O., & Ogeba, J. (2019). Basic Science and Technology as a predictor of quality science education. *International Centre for Science, Humanities and Education Research Journal (ICSHERI)*, 4(2), 178-187.
- Erinosho, S. Y. (2005). Gender and education in Sub-Sahara Africa at Beijing Conference, New York.
- Ezike, B. U. (2018). Classroom environment and academic interest as correlates of achievement in senior secondary school Chemistry in Ibadan South West Local Government area of Oyo state, Nigeria. *Global Journal of Educational Research*, 17, 61-71.
- Fadiji, E. A. (2016). *Secondary school students' perception of mathematics teachers' characteristics as predictor of learning outcomes in mathematics in Ondo State*. Unpublished, M.Ed Dissertation, Adekunle Ajasin University, Akungba Akoko, Ondo state, Nigeria.
- Federal Republic of Nigeria (2004). *National Policy of Education*. Lagos: Federal Ministry of Education.
- King'Aru, J. M. (2014). *Factors contributing to poor performance of science subjects: A*

case of secondary schools in Kawe division, Kingdom municipality. Unpublished, M.Ed. dissertation submitted to the open University of Tanzania.

- Mangal, S. K. (2007). *Essential of Educational Psychology*. New Dehli: Prentice-Hall of India Private Limited.
- Oduol, N. N. (2013). Relationship between mathematical ability and achievement in mathematics among female secondary school students in Bayelsa state, Nigeria. *Procedia – Social and Behavioral Sciences*, 106, 2230-2240.
- Ogunleye, A. O. (2009). Science education reforms and its implications for the professional development of science teachers in Nigeria. 44th STAN Annual Conference Proceedings, 19-177.
- Olagunju, A. M. (2010). Enhancing girls' participation in science. In S.O. Ayodele (Ed.), *Teaching strategies for Nigerian secondary schools*, 187-200.
- Olanrewaju, A. O. (2009). Evaluation of the teaching of Integrated Science in Lagos and Ondo States' Junior secondary school. Science Teachers' Association of Nigeria, 4th annual conference proceeding. Heineman Educational Books (Nigeria) Plc.
- Olatoye, R. A., & Aderogba, A. A. (2011). Performance of senior secondary school science students in aptitude test: The role of student verbal and numerical abilities. *Journal of Engineering Trends in Educational Research and Policy Studies*, (JETERAPS), 2(6), 431-435.
- Suleiman, J., & Daniel, F. (2014). Relative predictive validity of UTME, Post-UTME and Interest test scores for achievement in Nigerian University. *Journal of Teaching and Education*. ISSN: 2165, 355-367.

**CAUSAL MODEL OF PSYCHOLOGICAL CONSTRUCTS AFFECTING
STUDENTS' ACHIEVEMENT IN ELEMENTARY MATHEMATICS (MTH 101)
IN THE UNIVERSITY OF JOS, NIGERIA**

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Abstract

The study investigated the Causal Model of psychological constructs affecting students' achievement in Elementary Mathematics 1 (MTH 101) at University of Jos, Nigeria. The study adopted an ex-post-facto and correlation research designs. A sample of 400 respondents was drawn from a population of 4188, comprising all 100 level and carryover students who registered for Elementary Mathematics 1 in 2018/2019 academic session using convenience sampling technique. Data was collected by means of a questionnaire tagged Students' Questionnaire (SQ) on psychological constructs affecting achievement, adapted and validated by three experts in Research, Measurement and Evaluation. The reliability coefficient obtained was 0.80. The data collected were analysed using the Path analysis method in SPSS/AMOS. The findings of the study showed that teachers' effectiveness, study habits, interest and locus of control have a direct significant effect on students' achievement and that teachers effectiveness, attitude, study habits, locus of control and motivation have an indirect significant effect on students achievement in Elementary Mathematics 1. The findings also showed that a meaningful causal model of the psychological constructs was developed with a chi-square value of 0.240($p > 0.05$) which means the saturated model is not significantly different from the hypothesised model. It was recommended that students should develop good study habits, high internal locus of control and high motivation towards Elementary Mathematics 1 (MTH 101) in order to improve their performance.

Key words: Elementary Mathematics 1, Psychological constructs and Teacher effectiveness

INTRODUCTION

Mathematics is the science of space, quantity, structure and others in its relational component. It is the science that draws necessary conclusion and the language of all scientific findings. From mathematics other subjects derived their concepts, in both arts and sciences. It is also seen as international language, essential in almost every fields, such as handling money, measurements in fashion and carpentry, technical, economics and so on, it is regarded as master of all sciences, such as chemistry, physics, biology and economics. Mathematics is a way of thinking and organizing a logical proof. It can be used

to determine whether or not an idea is true, or at least, whether it is probably true as a way of thinking, as it gives insight into the power of human mind and becomes a challenge to intellectual curiosity. That is why any individual who is competent in mathematical sciences, can equally have the ability to do any other course. Consequently, a good performance in mathematics is important. It is a requirement in everyday life and everyone needs the knowledge of mathematics (Kajuru, 2009).

In academics, the basic mathematical knowledge is essential in the completion of school and progress or advanced to the profession that they will aspire in life. Mathematics helps to train a child to think, reason, analyse, and articulate logically, all fields of studies are dependent on it for problem solving and prediction of outcomes. Competency in mathematics learning is vital to any individual and nation in domestic, business deals, scientific discoveries, technological breakthrough, problem-solving and decision making in different situations in life. It may be in consideration of these and other vital usefulness of mathematics that the Federal Government of Nigeria made it a core and compulsory subject at all the levels of 6-3-3-4 system of education in Nigeria as contained in the National Policy on Education (FRN, 2004) which still remains the rallying point for all educational objectives in Nigeria.

Despite the importance of mathematics, the subject is the most dreaded to learners among all the subjects offered in schools (Ashcraft & Faust, 1994; & Akinoso, 2016). Students tend to respond to mathematics with less self-confidence, negative feeling, poor reading culture and anxiety amongst others, leading to students' poor performance in the subject.

Furthermore, Elementary Mathematics which has the code MTH 101 is a 3 Credit course, is one of the core courses offered by 100level students in the Department of Mathematics, Faculty of Natural Sciences, University of Jos with twenty-three (23) Departments offering the course with the aim of building on what the student were taught in secondary school and prepare them for advance mathematics. Elementary Mathematics 1 is compulsory for all mathematics and basic science students and any mathematics students that fail the course will have an extra academic year because it is a prerequisite course. Students' performance in Elementary Mathematics 1 was poor, this is the summary of students' performance for six consecutive years, from 2016/2017 to 2011/2012 academic session, for 2017, out of 4845 students that sat for MTH 101 examination 4271 (88%) passed and 574 (12%) failed. In 2016, 3480 students sat for the examination 1888 (54%) passed, 1502 (43%) failed and 90 (3%) student results was withheld also in 2015, out of 3229 students sat for MTH 101 examination 1642 (51%) passed, 1587 (49%) failed while in 2014, 1967 students sat for the examination, 1071 (54%) passed and 896 (46%) failed. Furthermore, in 2013, out of 1863 students that sat for MTH 101 examination 1355 (73%) passed and 508 (27%) failed and in 2012, 2896 students sat for the examination, 1741 (60.12%), 1153 (39.81%) and 2 (0.07%) results were withheld.

The persistent poor performance of students in Elementary Mathematics 1 at the University of Jos has been a serious concern to stakeholders and elements like parents (family factors), teachers (academic factors) and students (personal factors) may be

attributed to students' poor performance in this course and some psychological constructs in student factors were suspected. Among these are interest, attitude, study habit, motivation, self-efficacy, locus of control and teachers' effectiveness. Psychological construct according to Fried (2017) is the characteristics or traits of an individual, it is a person's tendency to behave or feel a certain way. The findings of these studies (Ajayi, Lawani & Adeyanju, 2011; Li, 2012; Jiao, Collin & Onwuegbuzie, 2013) on effects of psychological constructs such as attitude, self-efficacy, self-concept, poor reading culture, research anxiety among others revealed that these psychological constructs had significant effects on students' academic achievement. Hence the study sets to ascertain the potency and interrelationships among the various psychological constructs as it relates to MTH 101 and to look at the combined interactions of the constructs on achievement of 100 level students in MTH 101.

Interest is a powerful motivational construct which energizes learning, guides academic and career trajectories and is essential to academic success. Something that interests you will attract your attention so that you want to learn or hear more about it or continue doing it. It is an enduring predisposition to re-engage over time (Hidi & Renninger, 2016). This suggests that mathematics interest test for Senior Secondary level has to do with mastering the prerequisite skills in Junior Secondary School (JSS) level mathematics that can enable the JSS 3 students cope with further learning of mathematics at the next higher level of mathematics teaching in Senior Secondary School One (SS I) level. Mathematics interest test can be developed and used as an indicator of success in any mathematics course (Idigo, 2010 & Goolsby, 2013). Some research suggested that, compared to other subjects, there is a relatively strong relationship between interest and achievement in mathematics

Attitude is an important element that determine students' success. Some psychologists regard attitude towards Mathematics as just a matter of like or dislike for Mathematics, while others extend the meaning to embrace beliefs, ability, and usefulness of Mathematics. For instance, Zan and Martino (2007) refer to attitude towards Mathematics as just a positive or negative emotional disposition towards the subject. Another school of thought define attitude towards Mathematics as an aggregated measure of “a liking or disliking of the subject, a tendency to engage in or avoid Mathematical activities, a belief that one is good or bad at Mathematics, and a belief that Mathematics is useful or useless”, this includes the tendency to be fearful of and anxious about it (Zan & Martino, 2007).

Study habits is the degree to which the students engage in regular acts of studying that are characterized by appropriate studying routines occurring in an environment that is conducive for study, students' study habit vary from one student to the other and from one place to another (Sorenson, 1991). It is an important aspect of learning because students' achievement in schools depends greatly on their study habits. It plays a vital role in reflecting the standard of education and the students' achievement in mathematics. The combination of both the classroom learning and out of classroom learning make up students' study habits. It was posited that one must study with the primary aim of understanding the content and not being in a hurry of getting through, rather sustained

concentration is necessary, a definite time table and taking brief of well organised notes. Many students fail in their examinations not because they lack knowledge or ability, but because they do not have adequate study habits and study skills. Good students are not born but are made by constant and deliberate practice of good study habits for which there is no substitute (Sorenson, 1991).

Another variable of interest is academic motivation. Motivation is the process in which goal directed activity is instigated and sustained. It is a force that energizes and directs behavior toward a goal (Eymur & Geban, 2011). It is one of the most important psychological concepts in education. Deci and Ryan (1985) identified two main types of motivation which are intrinsic motivation and extrinsic motivation. Intrinsic motivation arises from a desire to learn due to its inherent interests, desire for self-fulfilment and enjoyment with desire to achieve a mastery of a subject. The place of intrinsic motivation is internal. Intrinsic motivation for a task is shown when the individual carries out the task out of enjoyment or inherent satisfaction (Ryan & Deci, 2000; Vallerand & Ratelle, 2002). On the other hand, extrinsic motivation is a motivation to perform a task and succeed for the purpose of receiving a reward or due to an external force.

Self-efficacy is a psychological construct that relates an individuals' judgment of his/her capabilities to achieving certain goals in life. Artino (2012) defined self-efficacy as people's judgment of their capabilities to organize and execute courses of action required to attain designated types of performances. Studies have shown that students who are self-efficacious appear to use more self-regulated strategies which lead to higher achievements (Akomolafe, Ogunmakin & Fasooto, 2013; Hawthorne, 2014).

Locus of control has a significant impact on students' lives, as their decisions and choices related to academic performance, classroom behavior s, career development, interpersonal relationships and health are affected by their perception of control (Shinde & Joshi 2011). Locus of control is defined as an individual's perception about the underlying main causes of the various events that take place in their lives. It is the extent to which individuals believe their lives are controlled by themselves or by external factors. An individual can be classified as having either an internal locus of control or an external locus of control, and both evaluate successes and failures differently. Individuals with internal locus of control believe that they can control their life events because their behavior is determined by internal factors like hard work, decision-making, problem solving skills, efforts and persuasion. Students with an internal locus of control hold internal factors responsible for their success or failure and as a result, they become more self-reliant in achieving their goals. In addition, they are better at problem solving due to believing in their ability to do so. Conversely, individuals with an external locus of control believe their behavior is the result of external factors like luck, fate, chance and the people around them. Students with an external locus of control limit further improvement of their own skills, abilities, strengths and weaknesses by relying on external factors. Also, such people often view life as uncontrollable and difficult to cope with as they often hold superstitious beliefs (Shinde & Joshi, 2011).

Another construct concern is the influence of teachers' effectiveness on the

performance of students. Teacher effectiveness simply refers to the productivity of a teacher in terms of how well he/she handles the teaching-learning process such that the desired outcome is achieved. Teaching effectiveness has been accepted as a multidimensional construct since it measures a variety of different aspects of teaching such as; subject mastery, effective communication, lesson preparation and presentation (Akiri & Ugborugbo, 2009). An effective teacher is one who is intellectually challenging, motivating students, setting high standards and encouraging self-initiating learning (Hammond, 2010). Therefore, there is need to investigate how teachers' effectiveness and other variables as correlates students' achievement in Elementary Mathematics 1, at University of Jos.

Research Questions

The following research questions were answered in this study

1. What is the causal model of psychological variables on the 100 level students' achievement in MTH 101?
2. What is the direct and indirect total percentage effect of the psychological constructs on the 100 level students' achievement in MTH 101?
3. What is the model fit of the psychological variables of the 100 level students' achievement in MTH 101?

Hypotheses

The following hypotheses were formulated for the study and tested at 0.05 level of significance.

1. There is no significant difference between the saturated model and hypothesised model of the psychological constructs on the 100 level students' achievement in MTH 101.
2. The direct and indirect effects of the psychological constructs on the 100 level students' achievement in MTH 101 is not significant.

Methods

The study employed an ex-post-facto and correlation research designs. The ex-post facto design was used to explore possible causes and effects of how an independent variable (psychological constructs) present prior to the study affects a dependent variable (academic achievement). The correlation design was employed to establish the interrelationships between the direct and indirect effects of the independent variable on the dependent variable using the path analysis framework.

The convenience sampling technique was used to draw 400 students from the population of 4188 100Level students of the Faculty of Natural Sciences, University of Jos. The researcher administered the instruments to the students after the (MTH 101 examination of 2018/2019 academic session.

The Students' Questionnaire (SQ) was adapted from Shadrach (2017) and evaluated by experts in Research, Measurement and Evaluation. The questionnaire covered eight sections; A, B, C, D, E, F, G and H. Section A sought background

information of the students which includes departments and gender, section B was made up of 16 items that measured the Interest of students' in Elementary Mathematics 1, more so, section C was made up of 10 items that measured Attitude of students' to Elementary Mathematics 1, section D was made up of 13 items used to measure students' Study Habits also, section E consisted of 9 items used to measured Motivation, likewise, section F was made up of 15 items used to measured Teachers' Effectiveness while, sections G was made up of 15 items used to measured Self-Efficacy and sections H was made up of 16 items used to measured Locus of Control.

The Content validity of Student's Questionnaire (SQ) on psychological constructs affecting achievement was established based on scrutiny of three experts, two of the experts were in Research, Measurement and Evaluation and one in Department of Mathematics in the University of Jos to ensure that the content of the test measured the objectives it was designed to measure. The instrument for experts' judgment was rated 0, 1 and 2 and the agreement among the experts' judgements was determined using Kendall's coefficient of concordance, and a coefficient value of 1.0 was obtained. This showed that there was a strong agreement between experts. The reliability of the instrument was established for the questionnaire using Cronbach alpha method to estimate the reliability of the internal consistency which yielded a coefficient of 0.80 indicating that the instrument was very reliable.

Data analysis based on the research questions and hypotheses highlighted the results displayed in percentage. The responses of the students to the 94 multiple-choice items students' questionnaire on psychological constructs affecting achievement were coded and analyzed using Path analysis techniques with SPSS AMOS 18, to develop the causal model using the path analysis framework.

Results

Findings of the study were presented based on the research questions posed and hypotheses tested by the researcher.

Hypothesis One: There is no significant difference between the saturated model and hypothesized model of the psychological constructs on the 100 level students' achievement in MTH 101

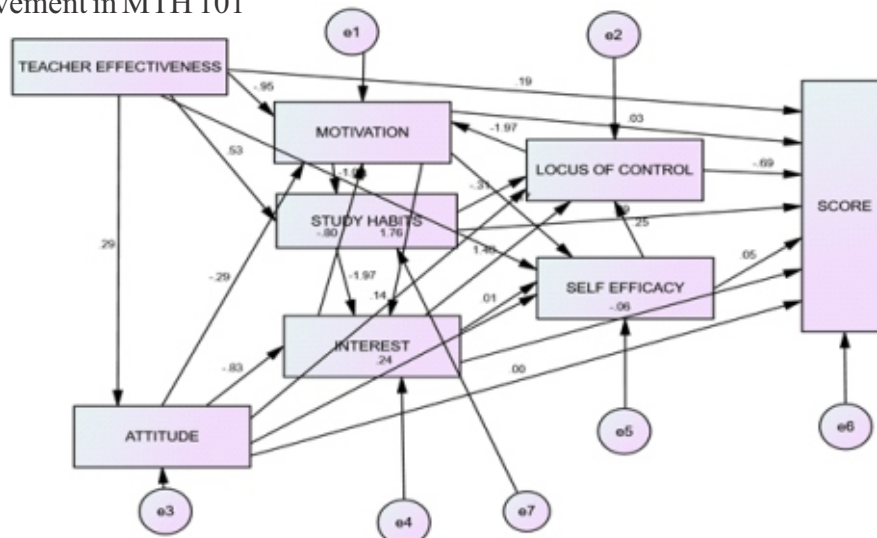
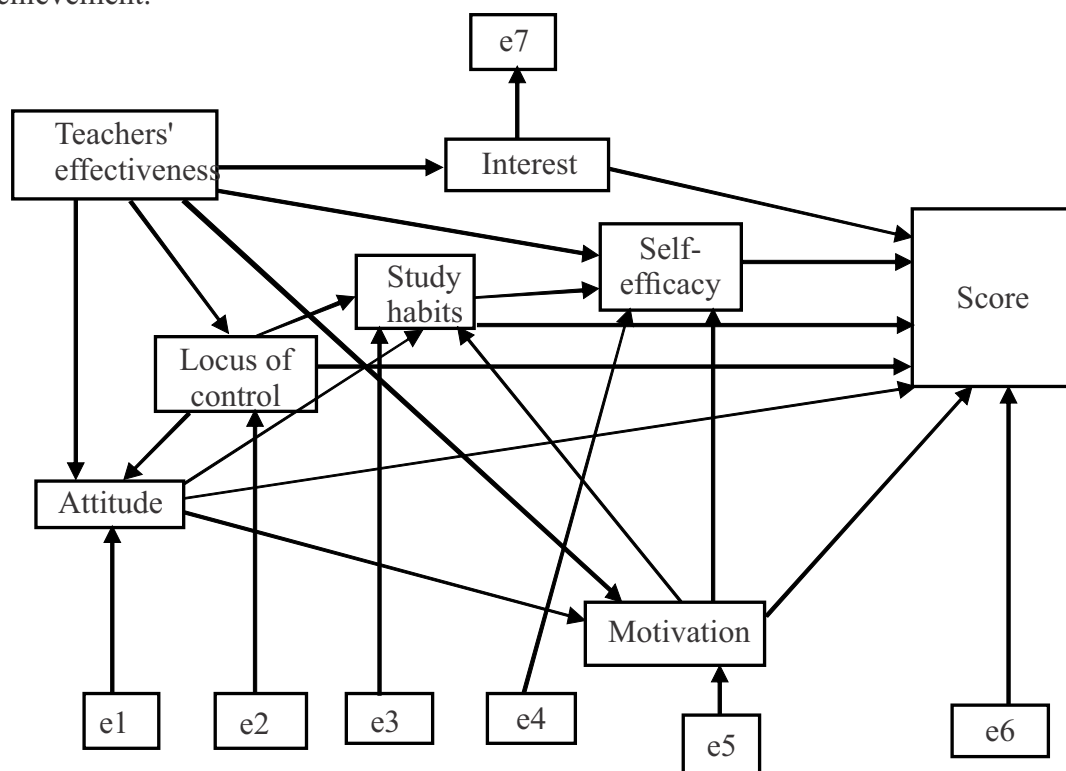


Figure 1: The Saturated Model of the Psychological Variables on Students Achievement in MTH 101

Figure 1 shows the developed causal model of the psychological variables on the 100level students' academic achievement in Elementary Mathematics 1 at University of Jos. There were 7 endogenous variables included e1, e2, e3, e4, e5, e6 and e7 that was disturbances/errors, there were 8 exogenous variables included attitude, motivation, interest, locus of control, teacher effectiveness, self-efficacy, study habits and achievement.

**Figure 2: Hypothesized Path Model****Table 1: Percentage of Direct and Indirect Effects of the Variables on Achievement of Students in MTH 101**

S/N	Paths	Direct Effects	%	Indirect Effects	%
1	Teachers effectiveness to Achievement	0.806	19.113	1.696	24.23
2	Attitude to Achievement	-0.017	0.403	0.666	9.51
3	Study habits to Achievement	0.519	12.31	0.738	10.54
4	Self-efficacy to Achievement	0.310	7.35	-0.223	3.19
5	Interest to Achievement	-0.265	6.28	0.081	1.16
6	Locus of Control to Achievement	-2.141	50.77	1.695	24.21
7	Motivation to Achievement	0.159	3.77	-1.900	27.14
	Total	4.219	100	6.998	100
		(37.61)		(62.39)	

Table 1 shows the direct and indirect percentages of the total effect of psychological constructs on 100 level students in Elementary Mathematics 1. The highest percentage of the direct effect was (50%) which was from locus of control to achievement but it was a negative direct effect, whereas the least percentage direct effects was (0.4%), from attitude to achievement with a total direct effect of 4.219. Also, motivation had the highest percent indirect effect of 27.14 on students' achievement in Elementary Mathematics 1. The direct paths have (37.61%) effects, while the indirect paths have (62.39%) effect in the model.

Table 2: Result Analysis on the Model Fit of the Psychological variables on Students Achievement in MTH 101

Index	Value	Remark
Goodness of Fit Index (GFI)	0.999	Good Model fit
Normed Fit Index (NFI)	0.996	Good Model fit
Comparative Fit Index (CFI)	0.999	Good Model fit
Root Mean Square Error of Approximation (RMSEA)	0.033	Good Model Fit

Table 2 reveals the summary of the model fit indices of the saturated and hypothesised models. The Goodness of Fit Index (GFI), the normal fit index (NFI) and the Comparative Fit Index (CFI) of the saturated model are 0.999, 0.996 and 0.999 respectively and according to Wuensch (2016) and Hoyle (2011), a GFI, NFI or CFI value greater than 0.95 is a good model fit. Therefore, the saturated model is good and acceptable. Also, the Root Mean Square Error of Approximation (RMSEA) of a good model should be less than 0.05 (Kline, 2010). The RMSEA of the saturated model is 0.033 which indicates that the model is good.

Also, Figure 1 shows the developed causal model of psychological variables of 100level students' achievement in Elementary Mathematics 1. It should also be noted that only the endogenous variables that has arrows pointing at them form the error terms indicating that the developed path model of psychological variables of 100level students' achievement in elementary mathematics is a very good model as indicated by its model fit indices of 0.999, 0.996 and 0.999.

Table 3: Result Analysis on Difference between Saturated Model and Hypothesised Model of the Psychological variables on Students Achievement in MTH 101

Index	Value	DF	P-Value	Remark
Chi-square	4.208	3	0.240	Insignificant
Goodness of Fit Index (GFI)	0.999			Good Model fit
Normed Fit Index (NFI)	0.996			Good Model fit
Comparative Fit Index (CFI)	0.999			Good Model fit
Root Mean Square Error of Approximation (RMSEA)	0.033			Good Model Fit

From Table 3, the saturated model has been associated at 1.403 percent, while the independence model has been associated at 36.078 percent with the hypothesized model. The root mean square residual is 0.083, it is the mean absolute value of the covariance residuals which reflect the difference between observed and model estimated covariance.

The goodness of fit of the model is 0.997 which is an indication that (99.7%) has been fitted in the saturated model for the proportion of variance –covariance matrix. The normed and comparative fit indices are 0.996 and 0.999, since they are values close to one, it indicates a good fit. From the table, the Chi-square test of goodness of fit revealed that the saturated model is not significantly different from the hypothesized model. The result yielded $\chi^2 = 4.21$, $p = 0.240$, since the p -value is greater than 0.05 level of significance, the null hypothesis was accepted and it was concluded that there was no significant difference between the saturated model and the hypothesized model.

Table 4: Direct and Indirect Effects of the Variables on Students' Achievement in Elementary Mathematics 1

S/N	Paths	Direct Effects	P-Value	Indirect Effects	P-Value
1	Teachers effectiveness to Achievement	0.806	0.000	1.696	.007
2	Attitude to Achievement	-0.017	.928	0.666	.016
3	Study habits to Achievement	0.519	0.000	0.738	.008
4	Self-efficacy to Achievement	0.310	0.059	-0.223	.108
5	Interest to Achievement	-0.265	0.027	0.081	.544
6	Locus of Control to Achievement	-2.141	0.000	1.695	.012
7	Motivation to Achievement	0.159	0.379	-1.900	.010

Table 4 shows the direct and indirect effects of the causal variables on 100level students' achievement in MTH 101 with their corresponding p -values to test for significance. The direct effects of the paths between attitude, motivation and self-efficacy to achievement were found not significant, since the p -values are greater than 0.05 level of significance ($p > 0.05$), but teachers' effectiveness, study habits, interest and locus of control had a significant direct effect on students achievement since the p -values were less than 0.05 level of significance ($p > 0.05$). Also, the indirect paths between teacher effectiveness, attitude, study habits, locus of control and motivation had a significant indirect effect on students' achievement since the p -values were less than 0.05 level of significance ($p > 0.05$). However, only self-efficacy and interest had indirect effect that is not significant with p -values of 0.108 and .544 respectively.

Discussion

The Findings from the research questions revealed that the highest percentage of the direct effect was from locus of control to achievement but it was a negative direct effect, whereas the least percentage direct effects was from attitude to achievement. Also, motivation had the highest percent indirect effect on students' achievement in Elementary Mathematics 1. This is contrary to the findings in the work of Shadrach, Bulus and Terwase (2018) who found that study habits had the highest direct effect and teachers' effectiveness to have the highest indirect effect on students' achievement in research methods. The total direct paths have (37.61%) effects, while the indirect paths have (62.39%) effect in the model.

The findings of the study revealed that the saturated model was not significantly different from the hypothesized model. Also, the direct effects of the paths between

attitude, motivation and self-efficacy to achievement were not significant, since the p -values were greater than 0.05 level of significance ($p>0.05$). On the other hand, teachers' effectiveness, study habits, interest and locus of control had a significant direct effect on students' achievement. The indirect paths between teachers' effectiveness, attitude, study habits, locus of control and motivation had a significant indirect effect on student's achievement since the p -values were less than 0.05 level of significance ($p>0.05$). However, self-efficacy and interest had indirect effect that was not significant.

Conclusion

Based on the findings of the study, it can be concluded that the developed meaningful path model can be used to understand the causal links among variables such as interest, attitude, study habit, motivation, teacher effectiveness, self-efficacy and locus of control. It further revealed that locus of control had the highest percent of direct effects on achievement, while motivation had the highest percent indirect effect. This implies that there should be positive attitude, high motivation, good study habits and teacher effectiveness for students to improve on their academic achievement in MTH 101. It was discovered that there is no significant difference between the hypothesized and saturated model.

Recommendations

The following recommendations were made based on the findings of the study:

1. Students should develop good study habits and high motivation to improve on their achievement in Elementary Mathematics 1
2. The study recommended that the university can utilize the developed path model in order to give necessary guidance and counselling to students before they take Elementary Mathematic 1 examination.
3. The study also recommended that lecturers should improve on their teaching styles, motivate the students and encourage them to study hard.

References

- Ajayi, K.O., Lawani, A. O., & Adeyanju, H.I. (2011). Effects of students' attitude and self- concept on achievement in senior secondary school mathematics in Ogun State, Nigeria. *JORIND*, 9(2), 202-211.
- Akiri, A.A., & Ugborugbo, N.M. (2009). Teachers' effectiveness and students' academic performance in public secondary schools in Delta State, Nigeria. *Studies on Home and Community Science*, 3(2), 107-113.
- Artino, A.R. (2012). Academic self-efficacy: from educational theory to instructional practice. *Perspectives on Medical Education*, 1(2), 76-85.
- Ashcraft, M.H., & Faust, M.W. (1994). Mathematics anxiety and mental arithmetic performance: An exploratory investigation. *Cognition and Emotion*, 8(2), 97-125.
- Deci, L.E., & Ryan, R.M. (1985). Self-determination moderates the effects of perceived

- competence on intrinsic motivation in an exercise setting David Markland
University of Wales, Bangor. *Journal of Sport and Exercise Psychology*, 21(4),
351-361.
- Eymur, G., & Geban, O. (2011). An investigation of the relationship between motivation
and academic achievement of pre-service chemistry teachers. *Education and
Science*, 36(161), 246-255.
- Federal Republic of Nigeria (FRN) (2004). *National Policy on Education* (4th ed.). Lagos:
NERD Press, 13-14.
- Fried, E.I. (2017). What are psychological constructs? On the nature and statistical
modelling of emotions, intelligence, personality traits and mental disorders.
<http://dx.doi.org/10.1080/17437199.2017.1306718>
- Goolsby, L. (2013). *School Interest*. Boston: Allyn and Bacon.
- Hammond, D.L. (2010). *Evaluating teacher effectiveness. How teacher performance
assessment can measure and improve teaching*. <http://www.highered.nysed.gov>
- Hawthorne, S. (2004). *Engaging reluctant writers in secondary school English*.
<http://www.english.unitechnology.ac.nz>
- Hidi, S., & Renninger, K.A. (2006). The four-phase model of interest development.
Educational Psychologist, 41(2), 111-127
- Idigo, E.C. (2010). *Effective Method of retaining students' interest in mathematics in
secondary schools in Enugu East local government area of Enugu State*.
Unpublished UG Thesis, Institute of Ecumenical Education, Thinker's Corner,
Enugu.
- Jiao, Q., Collins, K., & Onwuegbuzie, A. (2013). Cooperate group performance in
graduate research methodology course. [http://www.collegequarterly.ca/2013-
vol16-num02-spring/jiao.html](http://www.collegequarterly.ca/2013-vol16-num02-spring/jiao.html)
- Kline, R.B. (2010). *Principles and practice of structural equation modelling*. New York,
NY: Guilford Press.
- Li, L.K.Y. (2012). A study of attitude, self-efficacy, effort and academic achievement of
CityU students towards research methods and statistics. *Discovery Social
Sciences E-Journal*, 1(2), 154-183
- Pearl, J. (2000). *Causality*. Cambridge University Press.
- Ryan, R.M., & Deci, L.E. (2000). Self-determination theory and the facilitation of
intrinsic motivation, social development, and well-being. *American*

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& IGONOH ACHENYO OKOLO, Ph.D.

Psychological Association, 55(1), 68-78.

Shadrach, E. O, Bulus, C.H., & Terwase, N.T (2018). A causal model of postgraduate education students' psychological constructs and their achievement in research methods in University of Jos, Nigeria. *Journal of Educational Foundations*, 8(1), 33-44.

Shinde, N., & Joshi, P. (2011). *What's your students' locus of control?*
<http://www.teacherplus.org/classroom-management/what-is-your-students>.

Sorenson, H.P. (1991). *Psychology of education*. N.Y USA McGraw Hill Book Co Inc.

Streiner, D.L. 2005. Finding Our Way: An Introduction to path analysis. Baycrest Centre for Geriatric Care, Toronto, (1), 115-22.

Vallerand, R.J., & Ratelle, C.F. (2002). *Intrinsic and extrinsic motivation*. University of Rochester Press. American Psychological Association. 37–63.

Zan, R., & Di Martino, P. (2007). Attitude toward mathematics: Overcoming the positive/negative dichotomy. *Age publishing and the Montana Council of Teachers of Mathematics*, 3(1), 197-217.

DETERMINING CAREER DEVELOPMENT NEEDS OF COLLEGES OF EDUCATION STUDENTS IN KWARA STATE, NIGERIA

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Abstract

Career development is a life-long process that requires planning for individual's success. Previous studies revealed that students at different educational levels have unique career development needs. This study determined the career development needs of colleges of education students. The study also considered whether the moderating variables of age, course of study, family type and gender significantly were associated with the career development needs of the respondents. The study adopted a descriptive survey, the correlation type. The multi-stage sampling technique was employed to select 416 respondents aged between 15-30 years. Out of this, 403 retrieved forms were valid for data analysis. The instrument for data collection was a validated questionnaire on Career Development Needs. The study found answer to what the career development needs of colleges of education students were. The findings of the study revealed that the respondents career development needs include: assistance on ways to manage life and career tasks, information about work-related practices among others. Age, course of study, family type and gender have no significant association with the career development needs of respondents. Based on the findings, the study recommended that counselors in the college counselling centers should organize programs to train students on life skills require for appropriate management of life and career tasks irrespective of their age, family background, gender and course of study, so that they can be equipped in managing their life and career tasks.

Key words: career, career development needs, colleges of education, students

Introduction

Man's engagement in work activities are strives towards meeting personal needs and that of the society. Career is commonly described as a chain of functions or tasks in a single or a couple of occupations which can be considerably induced by various circumstances. It is a fundamental pursuit over which people organize a way of life. Career development is a life-long process that requires planning for individual's success.

In educational setting, career development offers students opportunities for deciding the profession or discipline (s) to embark upon in future (Niles & Harris-Bowlsbey, 2002). Preparation towards a vocational development can result into securing

vocations that are agreeable to a person's disposition or makeup and one that brings about superior feeling of contentment and gratification which could attract additional proceeds (Career Advise, 2017).

Bloxom et. al, (2008) posit that learners' career development requisites spin round scholastic ground plans, significance of secondary school training to prospective selection of career, occupation and unpaid work involvement, attainment of on-the-job competencies and career aspirations. They added that students' exposure to employment outlet data, individual vocational/career counselling and online job-related facts and figures also form part of the career development needs of students identified. Relating this to college of education students' career development needs, this could rotate round scholastic plan, significance of Nigerian Certificate in Education to prospective career choice, teaching practice and other unpaid work involvement, among other needs. McMahon and Watson (2005) found that students were more concerned to seek understanding of the life/career effects and life/career management tasks than to seek understanding of their peculiar interests, traits and features of work.

Research has shown that professional development needs on many occasions have strong ties with other human development requirements. For instance, Ball (2009) found that secondary school students in rural areas of United States needed to gain further awareness and comprehension of: financial assistance, institution requirements and the career prospects available for them.

Researches (Greenhaus, 2002; Jiang, 2003) have ascertained divergence in male and female career development needs. Larwood and Gutek (1989) found that the pattern of male's career is uncomplicated, characterized by uninterrupted progression; unlike the career advancement of female depicted as incoherent. Ornstein and Isabella (1990) maintained that child bearing and child rearing were responsible for the female adherence to traditional patterns of career development. The study observed that the length of period that female spent in their professions may not really impact their work performance due to the incoherence in their advancement. This notion is gradually changing in the contemporary world due to improved policies promoting women participations in work. The outcomes of the inquiry by Ornstein and Isabella (1990) imply that the alterations in people's career attitudes are largely dependent on age than emotional stage. The course that individual studies in higher institution may determine different needs for career development. The finance required for advancing in science related courses or information regarding further courses in Art-based courses may differ from commercial based courses among others. Individuals from large families may have different career development needs compared to students from monogamous/small families. Students from polygamous/large families may need motivations to complete tertiary education or finances to continue education to advance in their chosen career more than those from monogamous family setting.

Furthermore, professional school and career counsellors are in the best position to assist prospective teachers in meeting their career development needs through adequate planning and designing of activities and services to facilitate their career development

needs (Omotosho, 2016). To do this, there is the need to recognize such needs which may be peculiar to college students. In many Colleges of Education, little or no career guidance services are available for the students. This might deny the teachers in training the accessibility to the range of services required to make informed educational and career decisions. Some institutions have counselling centers but lack trained personnel to meet the students' career development needs. Jacobzone (2017) posits that African nations make little provision to address peculiar career development needs of students in advanced institutions of learning, they are less assisted in evolving career coping and innovative competencies, and to think through adopting self-employment opportunities. Jacobzone added that school-work transition, students withdrawn from institution or course of study are also not adequately considered.

Researchers (Ball, 2009; Bardick et al., 2004; Bloxom et al., 2008; Code et al., 2006; Gibbons et al., 2006) have been conducted on career development needs of students. Ball (2009) conducted a survey on career development and college planning requirements of secondary school students in the countryside of America and found that rural populace do sought better chances for career and institutional preparation, wanted career development programmes at an earlier time in their school life, needed to be aware of existing occupations, proficiency and aptitude required to fit into those occupations, sought better awareness about monetary assistance and financial management skills, and the need to enhance life skills. Also, Bardick et al (2004) found that secondary school students required enhanced skill preparation, better scores, assistance from a career facility, assistance to gain awareness regarding subject to offer in school.

The studies are relevant to the present study, though not conducted in Nigeria and specifically in Kwara State. Colleges of Education in Nigeria are established to turn out excellent educators who are will fit into scholarship and uprightness, to facilitate learning process at the basic education level. Trained teachers are expected to be enthusiastic, steadfast and dedicated in assisting learners to develop moral uprightness and necessary adjustment for viable growth and development of the individual and the entire nation. For teachers to function effectively in the discharge of their duties and to advance progressively in their career, it is necessary to assist them in meeting their needs. It is therefore imperative to pay attention to prospective teacher's career development needs so as to prepare them adequately to carry out their professional duties efficiently in the 21st century.

In addition, it has been suggested that career development programmes should not be restricted to secondary school levels alone (Ball, 2009).

This motivated the researchers to investigate career development needs of students in Kwara State colleges of education. Hence, the study investigated the career development needs of students of colleges of education in Kwara State. The study also examined the influences of variables of gender, age, family type and course of study on the colleges of education students career development needs.

Research Question

1. What are the career development needs of Colleges of Education students in Kwara State?

Hypothesis

1. There is no significant association between career development needs of the Colleges of Education students and their gender, age, family type and course of study.

Method

The study employed descriptive survey research design. All Colleges of Education students in Kwara State (14,210) from the eight colleges of education in Kwara State constituted the study population of the study (Kwara State Ministry of Tertiary Education, Science and Technology, 2018). Simple random sampling technique was used to select five out of the eight Colleges of Education in Kwara State. Proportionate sampling was adopted to select 416 respondents from the 14,210 students (Kwara State Ministry of Tertiary Education, Science and Technology, 2018) 184 from Kwara State College of Education, Ilorin, from Kwara State College of Education Oro, 78; 115 from Kwara State College of Education (Technical), Lafiagi; 9 from Muhyideen College of Education, Ilorin and finally 30 students from College of Education, Ilemona.

The instrument used for data collection was a two parts researchers-developed questionnaire titled "Career Development Needs of College Students Questionnaire" (CDNSQ) designed after a thorough review of relevant literature. The CDNSQ had two sections A and B. Section A elicited personal information of respondents. Section B contained Career Development Needs Scale with 20 items of four points rating scale.

The validity of the instrument was ascertained by five experts and its reliability was established using test re-test method and a correlation coefficient of 0.74 was obtained.

The biographic data of the respondents was scored using percentages. For section B, the percentage of respondents that strongly agree, agree, disagree and strongly disagree was computed to determine the major career development needs of colleges of Education students. A total number of 416 copies of the inquiry form were administered, however only 403 copies were duly completed and used for analysis. The data collected were analyzed using frequency tables and simple percentages for the demographic data. Also, for items on section B, the percentage of respondents that agree and disagree with each item were taken and analyzed to determine the major career development needs of the Colleges of Education students. The main hypothesis was tested using the Chi-Square statistics at 0.05 levels of significance.

Table 1: Distributions of Respondents' Demographic Characteristics

N	Variables		Frequency	Percentage %
1.	Gender	Male	202	50.1
		Female	201	49.9
		Total	403	100.0
2.	Age	15-20 years	69	17.1
		21-25 years	249	61.8
		26-30 years	85	21.1
		Total	403	100.0
3.	Family Type	Monogamy	341	84.6
		Polygamy	62	15.4
		Total	403	100.0
4	Course of Study	Arts	129	32.0
		Commercial	133	33.0
		Sciences	141	35.0
		Total	403	100.0

Results

Research Question: What are the career development needs of College of Education students in Kwara State?

The answer to this research question is presented in table 2

Table 2: Percentage distribution of respondents on Career Development Needs

N	As a teacher under training, my career development needs include:	SA	A	D	SD
1	career information	117 (29.0)	95 (23.6)	189 (46.9)	2 (.5)
2	labor market information	77 (19.1)	120 (29.8)	206 (51.1)	0 (.0)
3	how to be successful in college	101 (25.1)	135 (33.5)	167 (41.4)	0 (.0)
4	Individual career counselling	98 (24.3)	120 (29.8)	181 (44.9)	1 (1.0)
5	support in obtaining career plans	114 (28.3)	118 (29.3)	171 (42.4)	0 (.0)
6	finding ways to pursue things I am passionate about	110 (27.3)	105 (26.1)	118 (46.7)	0 (.0)
7	understanding my interests and abilities	104 (25.8)	114 (28.3)	185 (45.9)	0 (.0)
8	Information about financial help for continuing my education	104 (25.8)	101 (25.1)	195 (48.4)	3 (.7)
9	Information about institutions that offer courses to advancing my career	116 (28.8)	117 (29.0)	170 (42.2)	0 (.0)
10	understanding the relevance of educational achievement to life success	113 (28.0)	115 (28.5)	175 (43.4)	0 (.0)
11	help with planning the next steps in my career	101 (25.1)	128 (31.8)	174 (43.2)	0 (.0)
12	information about work-related practices	108 (26.8)	130 (32.3)	165 (40.9)	0 (.0)
13	Information about career opportunities within my community	108 (26.8)	107 (26.6)	163 (40.4)	25 (6.2)
14	help with choosing between two or more occupational options	108 (26.8)	101 (25.1)	194 (48.1)	0 (.0)
15	motivation to complete my tertiary education	118 (29.3)	118 (29.3)	167 (41.4)	0 (.0)
16	relevance of NCE education to future choice of career	105 (26.1)	114 (28.3)	120 (29.7)	64 (15.9)
17	how to prepare for and attend to job interview	99 (24.6)	116 (28.8)	168 (41.6)	20 (5.0)
18	acquisition of work-relevant skills	83 (20.6)	88 (21.8)	200 (49.6)	32 (8.0)
19	process of setting and achieving my career goals	109 (27.0)	113 (28.0)	179 (41.4)	2 (3.1)
20	management of life and career tasks	99 (24.6)	210 (52.1)	66 (16.4)	28 (6.9)

Table 2 shows that, the respondents' responses on their career needs skewed to the left (Strongly Agree & Agree). However, items 20, 12 and 15 indicated the topmost percentage distributions of 24.6 & 52.1%, 29.3 & 29.3; and 28.8% & 29.0% respectively; implying that they the topmost identified career development needs of the respondents. Large number of Colleges of education students, 309 (76.7 %) out the 403 respondents need assistance in the management of life and career tasks; 238 (59.1%) of the respondents need information about work-related practices while 236 (58.6%) need motivation to complete their tertiary education. Hence, career development needs of College of Education students in Kwara State are many but the most significant ones revolved around management of life and career tasks, information about work-related practices and motivation to complete my tertiary education

Hypothesis One: There is no significant association between career development needs of colleges of Education students and their age, course of study, family type and gender.

To verify this hypothesis, table 3 displays the results of the Chi-Square showing the association of demographic variables with respondents' career development needs.

Table 3: Chi-Square Result Showing Association between Respondents' Career Development Needs and their Gender, Age, Family Type and Course of Study

Hypothesis	Test	Value	df	p-value	Remark
CDN * Gender	Pearson's Chi-Square	28.790	39	.885	Retained
	Contingency coefficient	.258			
CDN * Age	Pearson's Chi-Square	71.053	78	.698	Retained
	Contingency coefficient	.387			
CDN * Family type	Pearson's Chi-Square	40.028	39	.424	Retained
	Contingency coefficient	.301			
CDN * Course of study	Pearson's Chi-Square	77.170	78	.505	Retained
	Contingency coefficient	.401			

Table 3 shows Chi-square result of the association between career development needs and respondents selected demographic profiles. The table shows that, χ^2 (39, 78, 39 & 78) = 28.790, 71.053, 30.028 & 77.170; $p = 0.885, .698, .424$ & $.505 > .05$. This means that there is no statistically significant association between career development needs of College Education students and their gender, age, family type and course of study. The contingency coefficients show .258, .387, .301 and .401 values respectively, which are very close to zero. This indicates that, the variables are independent of each other (one does not depend on the other); there is no association between career development needs of the respondents and their selected demographic profiles; hence, the hypothesis is retained.

Discussion

Career development needs of College students in Kwara State are numerous as depicted on Table 2. The findings of the study are in tandem with the findings of past

researches; McMahon and Watson (2005); Guneri et al., (2003); Muola et al., (2012) who found that the career development needs of college students included successful life management and career tasks. It also agrees with Bloxom, et. al, (2008) Aluede, et al., (2006) and McKay (2016) who reported that students need adequate information on work related practices for them to achieve success in their career path. Again Ball (2009), Hitchings, et al. (2001) observed that learners expressed the need to be assisted in choosing between two or more career options. The implication of these findings is that these needs of college students must be fulfilled for them to be able to achieve success in the career they eventually practice.

The hypothesis tested indicated no significant relationship in the career development needs and gender of Colleges of Education students in Kwara State. This means that gender has no influence on the career development needs of the students. The findings did not corroborate previous research findings on relationship of gender to career related concepts. For instance, Yu-Ching (2003) showed that gender is significantly related to respondents' career beliefs of male and female respondents. The study of Dik, Sargent and Steger (2008); and Choudhury and Jones (2010) also indicated that significant association exists in career development needs of students and their gender. The results of the study could probably be due to the fact that the study is conducted in institutions that train professional teachers only. It could have been a different result if other professions such as engineering related professions were considered.

It was shown in this study that age has no significant association with respondents' career development needs. The finding disagrees with the findings of Choudhury and Jones (2010) which indicated significant association of age with the career development efforts of students. The implication of this finding is that all college students across age groups have career development needs that must be met for them to succeed in their chosen career.

The type of family where respondents emerged had no contributory effect on their career development needs. This finding is in contrast with the finding of Okorodudu (2006) which revealed that the family type of students determined the career development needs of students. The reason behind the finding of this study could be that numerous factors other than an individual home, most especially; the jobs, educational and personality requirements might become instrumental forces in the career development needs of students.

The results of this study disclosed that respondents' course of study has no association with the career development needs. This finding is in line with Bashman and Buchanan (2009) which reported no significant association in their respondents' career development goals and motivation based on course of study. This finding suggests that a number of career development needs are similar for many students in order to make a wise career choice; hence, difference in their course of study might make no impact in the fulfillment of such needs.

Implications of Findings for Counseling Practice

The findings of this study have relevant implications for the practice of counseling as a profession. One of the areas of specialization in counseling is career counseling; which is germane to the successful career endeavors of every student irrespective of their educational level and to the development of the larger society. Regarding the findings of this study, it is important that counseling centers is established and make functional in every tertiary institution so that students' career development needs are attended to, thus enhancing future career choice and job satisfaction. This implies that well trained and competent career counsellors must be employed in the colleges' counseling centers to provide for career development needs of the students and help them towards achieving success in life.

Recommendations

Based on the findings of this study, it was recommended that:

1. The counselors in the colleges of education counseling centers should organize guidance and counseling programs to train students on life skills (time management, problem solving and interpersonal relationship skills) requirements for appropriate management of life and career tasks.
2. The college counselors should assist the students in accessing necessary information on work-related practices with regards to their different careers of interest to enable them to prepare adequately the career challenges.
3. College counselors should be conversant with different fields of study and professions as well as the job requirements, the education required, skills and potentials that will be needed to achieve success in such endeavors, to educate and help the students make informed career choice.
4. Career counselors should also provide all categories of students with relevant problem solving and decision-making skills needed to choose best career options.
5. College Counselors should also endeavor to organize Career fair and Exhibitions for graduating students, alumni and prospective employers to help implement acquired education in real life situations.

References

- Aluede, O., Imhonde, H., & Eguavoen, H. (2006). *Academic, career and personal needs of Nigerian university students*. Retrieved from <https://eric.ed.gov/?id=EJ732732>
- Ball, A. K. (2009). *Career development and college planning needs of rural high school students*. Master Thesis, Department of Counsellor Education, Wales University, Retrieved from <https://digitalcommons.brockport.edu/edc>
- Bardick, A. D., Bernes, K. B., Magnusson, K. C., & Witko, K. D. (2004). Junior high career planning: What students want? *Canadian Journal of Counselling*, 38(2), 104–117. <https://cjc-rcc.ualgary.ca/article/view/58732>
- Basham, R. E. & Buchanan, F. R. (2009). A survey comparison of career motivations of social work and business students. *Journal of Social Work Education*, 45(2), 187-208. <https://www.tandfonline.com/doi/abs/10.5175/JSWE.2009.200600112>

- Bloxom, J. M., Bernes, K. B., Magnusson, K. C., Gunn, T. T., Bardick, A. D., Orr, D. T. & McKnight, K. M. (2008). Grade 12 student career needs and perceptions of the effectiveness of career development services within high schools. *Canadian Journal of Counselling*, 42 (2), 79-100. <https://files.eric.ed.gov/fulltext/EJ796324.pdf>
- Career Advise (2017). What is career development? Retrieved from <https://www.googlelead services.com>
- Choudhury, A. & Jones, J. (2010). Age-gender interaction on the endeavor of career development. Retrieved from <https://business.illinoisstate.edu/katie/downloads/Age-GenderInteractionontheEdeavour.ofCareerDevelopment.pdf>
- Code, M., Bernes, K., Gunn, T., & Bardick, A. (2006). Adolescents' perceptions of career concern: Student discouragement in career development. *Canadian Journal of Counselling*, 40(3), 160-174. <https://files.eric.ed.gov/fulltext/EJ739917.pdf>
- Dik, B. J., Sargent, A. M., & Steger, M. F. (2008). Career development strivings: Assessing goals and motivation in career decision-making and planning. *Journal of Career Development*, 35(1), 23-41.
- Gibbons, M., Borders, D., Wiles, M. Stephan, J. & Davis, P. (2006). Career and college planning needs of ninth graders—As reported by ninth graders. *Professional School Counselling*, 10(2), 168-178.
- Greenhaus, J. H. (2002). Career dynamics. In W. C. Borman, D. R. Ilgen & R. J. Klimoski. (Eds.). *Comprehensive handbook of psychology Vol.12, Industrial and Organizational Psychology* (pp. 519-540). New York: Wiley.
- Gureri, O. Y., Aydin, G., & Skovholt, T. (2003). Counselling needs of students and evaluation of counselling services at a large urban university in Turkey. *International Journal for the Advancement of Counselling*, 25 (1), 53-63.
- Hitchings, W. E. Luzzo, D. A., Ristow, R., Horvath, M., Retish, P. & Tanners, A. (2001). The career development needs of college students with learning disabilities: In their own words. *Learning Disability Research & Practice*, 16 (1), 8-17.
- Jacobzone, S. (2017) *Statement made at the global platform for disaster risk reduction*. Organization for Economic Co-operation and Development (OECD) Retrieved from <http://www.preventionweb.net/english/professional/policies/v.php?id=53721>
- Jiang, Y. (2003b). *Theory of social gender differences in employment: Chinese women's social status at the turn of the century* (pp. 115-129). Beijing: Modern China Press.
- Larwood, L. & Gutek, B. A. (1989). Working towards a women's career development, In B. A. Gutek & L. Larwood (Eds.). *Women's career development*. (pp. 170-183), New

Bury Park, CA: Sage.

McKay, D. R. (2016). Career development: What is it and what factors influence it? Retrieved from <http://www.thebalance.com>

McMahon, M., & Watson, M. (2005). Occupational information: What children want to know. *Journal of Career Development, 31*, 239–249.

Muola, J. M., Maithya, R. & Migosi, J. A. (2012). The impact of year of study, gender, and academic performance on students' perception on academic advising in Kenyan universities. *International Journal of Asian Social Science, 2* (2), 137-145.

Niles, S. G. & Harris-Bowlsbey, J (2002). *Career development interventions in the 21st century*. Columbus, OH: Merrill Prentice Hall.

Okorodudu, R. I. (2006). *Education and reorientation for good citizenship in nation building: Counselling psychology approach*. Benin City: Ethiope Publishing Corporation.

Omotosho, J. A. (2016). Career guidance and students' choice of subjects in A. I. Idowu (Ed.). *Guidance and counselling in education*. (pp. 180-198), Ilorin: Unilorin Press.

Ornstein, S. & Isabella, L. (1990). Age versus stage models of career attitudes of women: A partial replication and extension. *Journal of Vocational Behavior, 36*, 1-19. <https://www.sciencedirect.com/science/article/abs/pii/000187919090011P>

**ASSESSMENT OF UPPER BASIC STUDENTS' ATTITUDE TOWARDS
LEARNING OF SEX EDUCATION IN SCHOOLS IN OSUN STATE, NIGERIA**

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Abstract

This study assessed the upper basic students' attitude towards learning of sex education in Schools in Osun State, Nigeria. The objectives of the study were to examine students' attitude towards learning of sex education, influence of gender and age on students' attitude towards learning of sex education. The study adopted descriptive design. The sample for the study was one hundred and fifty (150) students in selected schools using simple random sampling technique. A questionnaire titled "Upper Basic Students' Attitude towards Learning of Sex Education Questionnaire (UBSALSEQ)" was used for data collection. Construct validity of the questionnaire were conducted by two experts in measurement and test construction. The reliability coefficient was 0.81 obtained through the use of test re-test statistical technique. The data collected were analyzed using percentage and range to answer the research question while null hypotheses were tested using Chi-square statistical technique. The finding of the study showed that majority of upper basic students had positive attitude towards learning of sex education. Gender and age of the students were not significant variables on their attitude towards learning of sex education. Based on the findings, recommendations were made among others that Students should be given equal opportunities in the teaching and learning processes irrespective of their gender and age as these characteristics do not influence students' attitude. Students should internalize the knowledge gained through sex education class to improve their well-being.

Key word: Sex education, Upper basic schools, Students' attitude, Gender and Age

Introduction

Education is process of cultivating in citizens right values that make nation stronger and peaceful. The nation values represent its customs, traditional practices, norms and cultures which are inculcated in citizens for them to develop right attitudes that make disciplined and enable them contribute positively to development of their society. Education is not merely the random distribution of insert ideas, the regurgitation of pre-packaged facts, or the formal exchange of ideas between the teacher and students but how learners can clearly think, manipulate skills and transfer the learning experiences gained to solve problems by themselves and make right decision to solve social problems such as sexual harassment, child abuse, trafficking, rapping among others that enable them achieve their own conclusions rather than merely be influenced by others (Jimoh, 2007).

Education in Nigeria is classified into basic, senior secondary and tertiary institutions. The Basic education is a first level of education in the country. It is a reform

measure aimed at addressing the distortion in the primary education and inequality in educational opportunity. It is a nine-year educational programme designed for children within the age range of 0-15 years. It is compulsory for children within this age bracket. The vision of the programme is to acquire appropriate and relevant skills and values that will enable every child to contribute his/her quota to national development. The goals of Basic Education thus include the provision of opportunities for the child to develop manipulative skills that will enable the child function effectively in the society within the limit of the child's capacity and the acquisition of the ethical, moral and civic values needed for the laying of a solid foundation for lifelong learning (Federal Republic of Nigeria, 2013). At this level, students are expected acquire moral, right attitudes, values and skills assertive and communication skills that will help in decision making and enable them function effectively in the society in the society.

Sex education is a process of imparting young ones knowledge of physiological, mental, emotional and social development of human in relation to human reproductive system and changes that occur from adolescent stage to adulthood. It is the acquisition knowledge that deals with human sexuality and reproductive system. Sex education was introduced in upper basic education to provide adequate information about human sexuality and reproductive system. It was introduced to four subjects' curriculum at the basic education. The subjects are Social studies, Home Economics, Basic Science and, Physical and Health Education according to Nigerian Educational Research and Development Council (NERDC, 2007). This type of education at this level of education was aimed to reduce peer influence about sexual intercourse, high risks sexual behavior s, abortion, unwanted pregnancies, and provide young ones with accurate information on human sexuality for them to develop and understand their nature, values, attitudes and beliefs about sexuality (Monday, Elizabeth, Bukola, Mary, Momoh, David, & Saminu, 2018). This would enable the learners to gain positive experiences about sexuality and enhance the quality of their relationships with opposite sex.

Sex education is needful and necessary for young ones especially upper basic students who are adolescents and facing different challenges as a result of changes experience in their bodies in which some of their parents are not available to offer explanation and share their experiences with their children. Studies such as Ogunjimi, (2006), Netsanet, Tsion, Fessahaye and Fentie, (2012) and Kingsley, Kobina, Maxwell and Linda, (2014) have shown that many parents do not have time for their children believe that school could offer the children total experiences that can make them survived without being mindful of the exposure and individual differences that exist among the students, influence of mass media, as well as group peers. Sex education teaches young ones about sexual intimacy that enlightens them on their reproductive system, birth control as well as sexually transmitted diseases. It also exposes them to their gender identity, gender role, family role, body images, sexual expression (what entails and how to time it), intimacy and the marriage relationship (Netsanet, et al., 2012). In sex education relevant and accurate information about sexuality for both boys and girls are provided in the upper basic curricula depending on attitudes of learners towards learning of the concepts. It will be unfair to ignore the fact that some parents are not aware of children level of maturity. Therefore, sex education should be internalized in children lives as they

grow up in a very mature way. This will in long way reduce rate of rape that be devil the society. Some parents feel reluctant to answer their children's question properly thinking that their level of exposure and maturity are not significant. It is not appropriate to pretend as if sex never exists. Some parents are fooling themselves and exposing children to untimely dangerous curiosity (Kingsley, et al, 2014).

The children need to be taught how to cope and handle their own sexual feeling, guide against peer influence, social media, use of drugs and display positive attitudes towards values system. It has been noticed that well informed children about puberty and human sexuality behave better than the uninformed ones (Ogunjimi, 2006). Sex education provides children with better understanding of others' attitudes, relationships, pattern of behavior and nature. A sexuality-oriented child learns to believe in the quality life style, set up a happy marriage as well as becoming responsible family (Laun, 2000).

Many problems confront teachers who are taking sex education topic in the classes. Among these problems is the prominent one of the attitudes of learners towards the topic (Ogunjimi, 2006). Sex education covers areas such as teaching what the menstrual cycle means, so that when students get to the stage, they would not see it as a problem but an issue or stage that leads to maturity. The teenage girls and boys need to understand the basic physiological changes and sexual issues that will enable them to cope and exercise certain level of tolerance and attitudes among their peers so as to avoid the risk involved in sex outside marriage, live a responsible life style and a desirable standard of living that is acceptable in the society.

This type of education should be given to children throughout the school years as it is important in the present society. Raping, sexual harassment, prostitution among others are social problems that could be tackled through education. This type of education is supposed to start at early childhood in the schools, and at home. This would facilitate and enhance learners' understanding of sex education. Researchers such as Monday, et al (2018) discovered that adolescent students held generally positive attitudes towards sexuality education, with female holding more positive attitudes than male counterpart. It is also emphasized that the education provides learners with valuable information that prevent them from the social problem. Sex education is not merely a matter of genital response but emotional motive relationship which carries joy and comfort for those experience it. It is essential for everyone as it important in all aspects of human life. At whatever stage of life; childhood, adolescent, adulthood, or old age, all these require a firm sexual identity and knowledge of the role and responsibilities attached to the social status. It is affirmed that through the learning of Sex education, the individual will be well informed about the functions of sex organs and consequence of irresponsible sexual relationship as this is the period most of the unwanted pregnancies and sexually transmitted diseases occur. It is also pointed out that parents in particular and the society in general should not create communication gaps between them and the young people. This assists them not to fall victims of unscrupulous characters. Also, through the knowledge of sex education, learners would be equipped with the skills of detecting differences between love and infatuation as well as pedophiles among the elders in the society (Ogunjimi, 2006).

In schools, sex education should begin at least when children are 12 years old in middle basic or at first year in upper basic level. At this level, students begin to ask questions about sex education as they increase in age. Many children begin to question their parents about sex at ten years when they are about to graduate from middle basic to upper basic classes. It was found that many questions are asked at around age 12. Boys tend to ask a lot of questions at around age 9 and girls at age 9 and 13. The boys and girls are sexually active quite early by 12 years (Hyder & Delamater, 2007).

Small and Luster (1994) stated that age is highly related to the livelihood of an adolescent being sexually active. Studies found out that adolescent endorsed more strongly to the qualities of having a lot of money, being fun, being sexy and being good looking in their descriptions of the opposite sex ideal person. Low self-esteem is associated with early intercourse in girls but not boys while high self-esteem is associated with early sexual activity in males. Hence, attitudes of learners towards learning of sex education is crucial. It is a vital factor that determined the acquisition and internalization of knowledge gain through sex education. Therefore, this assessed attitudes of upper basic students towards learning of sex education in schools.

Many young children such as upper basic students are prone to irresponsible sexual relationship that resulted to transmitted diseases including the deadly disease HIV/AIDs and challenges of teenage pregnancy. Consequentially, the rate of drop-out among secondary school students is not only persistently increasing but social vices such as drugs abuse, prostitution and abortion are also rampant in the society. Studies such as Monday, et al. (2018) and Ogunjimi, (2006) have shown that this happens because of inadequate information about sexual behavior among the students which resulted to peer influence. Many younger people lack adequate information about human sexuality from their parents and elder people who are responsible for their orientation and training. However, some of the elders in the society are paedophiles. Hence, they are prone to such social challenges. Students sometimes get information about sex through their friends or through different sort of social media that mislead and create problems for them. Therefore, upper basic students are incoming adolescent that need adequate information about sexuality. Government has intensified efforts by introducing Sex education into basic education curriculum to enrich students with adequate information about sexuality and other information that enable them to make right decision and be responsible in society. Hence, this study assessed upper basic students' attitudes towards learning of sex education in schools.

The main purpose of this study is to assess the upper basic students' attitude towards learning of sex education in schools in Osun State. Specifically, the study examined: attitude of upper basic school students towards the learning of Sex education, influence of peer group, gender and age on the students' attitude towards the learning of sex education.

Research question

The following research question was answered in the study:

What is the attitude of upper basic students towards learning of Sex education?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the attitude of male and female upper basic students towards learning of sex education.
2. There is no significant difference in the attitude of 10 – 13 years old and 14 years and above upper basic students towards learning of sex education

Methodology

The study adopted descriptive type of research design. This is considered appropriate because the study is describing characteristics of the students. The population of this study comprised all the upper basic public-school students that is, 351, 880 in Osun State. The total upper basic public schools in the state is 443. Multistage sampling procedure was employed for study. From each of the senatorial districts in Osun State, simple random sampling was employed in selecting two Local Government Areas. From each of the Local Government Areas, one public upper basic school was selected using simple random sampling technique. To do this, the researcher wrote the names of the upper basic schools in state in on small pieces of papers; they were folded, put in a hat/box and mixed up properly. Then selection was done by using dip-hat method to randomly select six schools from public schools. Simple random sampling technique was used to select twenty-five upper basic students in each of the selected schools in the Local Government Areas making a total of one hundred and fifty (150) upper basic III students on the basis that the students had been taught the topic, Sex education in various subjects at that level while other students in below classes (upper basic I and II) have not be thought the topic.

The instrument that used for this study is self-developed questionnaire titled “Upper Basic Students' Attitude towards Learning of Sex education Questionnaire (UBSALSEQ)”. The questionnaire consisted two sections (A and B). Section A was designed to collect information on the demographic data of the respondents; such as gender and age while section B sought information on students' attitude and peer group influence with a modified 4 Likert scaling of Very True of Me (VTM) - 4, True of Me (TM) - 3, Fairly True of Me (FTM) - 2 and Not True of Me (NTM) - 1.

To ensure validity of the instrument the questionnaire was given to two experts in Social Sciences Education, Faculty of Education, University of Ilorin for construct validity. The corrections and suggestions made by the experts were incorporated into final copies of the questionnaire for data collection. To ensure reliability of the instrument, test-retest method was adopted. Students who were not part of the sample of the study were involved. This took place within three weeks interval of the first and second administrations of the instrument. The data collected in the two administrations were analyzed using Pearson Product Moment Correlation co-efficient formula at 0.05 level of significance. The value of r got was 0.81. The descriptive statistic of percentage was used to answer the research question while inferential statistics of Chi-square was used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1

What is the attitude of upper basic students towards learning of Sex education?

To answer research question one, students' responses were summed and analyzed using descriptive statistics. The instrument was on a four-point scale of 1 to 4 with 10 items. The minimum obtainable score is 10 and maximum score of 40. With a cut score of 15 (40-10/2), a mean response of 10 to 25 indicated a negative attitude while a mean response of 26 to 40 indicates a positive attitude as shown on Table 1.

Table 1: Percentage on Attitude of Upper Basic Students towards Learning of Sex Education

Attitude to Sex Education	Range	Frequency	Percentage
Negative	10 – 25	16	10.7
Positive	26 - 40	134	88.3
Total		150	100.0

As shown on the Table 1, with a percentage response of 10.7 within the range of 10 to 25, the attitude of upper basic students towards learning of Sex education was negative while a percentage response of 88.3% (134) within the range of 26 to 40, shows that the attitude of upper basic students towards learning of Sex education was positive. This implies that the attitude of upper basic students towards learning of Sex education was positive.

Hypotheses Testing

Ho₁: There is no significant difference in the attitude of male and female upper basic students towards learning of Sex education.

Table 2: Chi-Square on Attitude of Male and Female Upper Basic Students towards Learning of Sex Education

Gender		Attitude towards Sex edu.			df	Cal.X ²	Sig.	Remark
Male	Count	7	51	58	1	0.195	0.659	NS
	Expected Count	6.2	51.8	58.0				
Female	Count	9	83	92				
	Expected Count	9.8	82.2	92.0				
Total	Count	16	134	150				
	Expected Count	16.0	134.0	150.0				

Table 2 showed a chi-square values of 0.195 and a p-value of 0.659, testing at an alpha level of 0.05. Since the p-value of 0.659 is greater than the alpha level of 0.05, therefore, the null hypothesis 1 is retained and this implies that there is no significant difference in the attitude of male and female upper basic students towards the learning of Sex education.

Ho₂: There is no significant difference in the attitude of 10 – 13 years old and 14 years and above upper basic students towards learning of sex education.

Table 3: Chi-Square on Attitude of Upper Basic Students towards Learning of Sex Education based on Age

Age		Attitude towards Sex edu.			df	Cal.X ²	Sig.	Remark
10-13 years old	Count	13	95	108				
	Expected Count	11.5	96.5	108.0				
14 years & above	Count	3	39	42	1	0.760	0.383	NS
	Expected Count	4.5	37.5	42.0				
Total	Count	16	134	150				
	Expected Count	16.0	134.0	150.0				

Table 3 showed a chi-square value of 0.760 and a p-value of 0.383, testing at an alpha level of 0.05. Since the p-value of 0.760 is greater than the alpha level of 0.05, therefore, the null hypothesis 2 is retained and this implies that there is no significant difference in the attitude of 10 – 13 years old and 14 years and above upper basic students towards the learning of Sex education.

Discussion

Finding of this study revealed that upper basic students have positive attitudes towards learning of sex education. This implied that students pay attention to leaning of sex education so that they could internalise the knowledge gained on the concept. The positive attitude of the students may be as a result of societal values on sexuality and parental social role in checking and regulating their children behavior towards opposite sex. This finding is consistent with that of Netsanet, et al. (2012) who reported that sex education is needful and necessary for our young ones. Being mindful of the exposure given to our young ones in school, in the media among their peers, sex education teaches our young ones about sexual intimacy but also enlightens them on their reproductive system, birth control and sexually transmitted diseases.

Finding of the study showed that there is no significant difference in the attitude of male and female upper basic students towards learning of sex education. Thus, gender has no significant difference in the attitude of students towards learning of sex education that is, both male and female pay attention equally towards learning of sex education. This finding is consistent with finding of Monday et al. (2018) who discovered that adolescent students held generally positive attitudes towards sexuality education, with female holding more positive attitudes than male counterpart.

In this study, finding revealed that there is no significance difference in the attitude of 10 – 13 years old and 14 years and above upper basic students towards the learning of Sex education. This implied that students of different age groups display positive attitude towards learning of sex education. This finding is consistent with finding of Hyder and Delamater (1997) who reported that many children begin to questions their parents about sex at ten years when they are about to graduate from middle basic to upper basic classes. It was found that many questions are asked at around age 12. Boys tend to ask a lot of question at around age 9 and girls at age 9 and 13. This finding is inconsistent with finding of Small and Luster (1994) who discovered age is highly related to the livelihood of an adolescent being sexually active.

Conclusion

Based on the findings of this study, it was concluded that majority of students have positive attitude towards learning of Sex education. There is no significant difference in the attitude of male and female upper basic students towards learning of sex education. There is also no significant difference in the attitude of 10 – 13 years old and 14 years and above upper basic students towards the learning of Sex education. Gender and age of the students do not significantly influence upper basic students' attitude towards the learning of sex education.

Recommendations

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

1. Students should internalize the knowledge gained through sex education class to improve their well-being.
2. Social Studies and other related disciplined teachers should take the sex education as important and very sensitive concept in the classroom.
3. Students should be given equal opportunities in the teaching and learning processes irrespective of their gender and age as these characteristics do not influence students' attitude.

References

- Federal Republic of Nigeria. (2013). *National Policy on Education (6th Edition)*. Abuja: NERDC Press.
- Hyder, J. S., & Delamater, J. (1997). *Understanding human sexuality*. Boston: McGraw-Hill.
- Jimoh, S. A. (2007). School discipline: re-examination. *Nigerian Journal of Guidance and Counseling*, 31, 1-17.
- Kingsley, N., Kobina, I. A., Maxwell, A., & Linda, D. A. (2014). Parental Attitude towards Sex education at the Lower Primary in Ghana. *International Journal of Elementary Education*, 3, (2), 21-29.
- Laun, S. P. (2000). Sex and human interactions. *Journal of Behavior Science*, 3, (4), 15-20.
- Monday, S. A., Elizabeth, E. A., Bukola, K. J., Mary, A. N., Momoh, I. A., David, U. O., & Saminu, A. (2018). The state of adolescent student attitude towards sex/sexuality education in today's contemporary society. *An International Scientific Journal*, 101, 205-216.
- Netsanet, F., Tsion, A., Fessahaye, A. & Fentie, A. (2012). Parents' perception, students' and teachers' attitude towards school sex education. *Ethiopian Journal of Health Science*, 22, (2), 99-106.
- Nigerian Educational Research and Development Council (2007). *9-year Basic Education Curriculum Social Studies for JSS 1- 3*. Abuja: UBEC.

- Ogunjimi, L. O. (2006). *Attitude of students and parents towards the teaching of sex education in secondary schools in Cross River State*. *Education Research and Review*, 9, 347-349.
- Small S. A. & Luster, T. (1994). Adolescent sexual activity: An ecological, risk-factor approach. *Journal of Marriage and the Family*, 56, 181–192.

**CENTRALIZED SECONDARY SCHOOL EXAMINATION AND BASIC
EDUCATION CERTIFICATE EXAMINATION AS PREDICTORS OF
STUDENTS' ACHIEVEMENT IN SENIOR SECONDARY CERTIFICATE
MATHEMATICS**

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Abstract

The study investigated Centralized Secondary School Examination and Basic Education Certificate examination as predictors of students' achievement in senior secondary school Mathematics in Imo State. It was investigated within the blue print of a correlational research design. One hypothesis guided the study. To accomplish the purpose of the study, a sample of 850 secondary school students were sampled from a population of 33, 074 students that enrolled for the SSCE for 2017/2018 academic session in the state. The selection of the sample was done through simple random sampling technique. Students' scores obtained from Centralized Secondary School Examination, Basic Education Certificate examination and students grades obtained from SSCE were used as data for the study. The data collected were analyzed using Multiple Regression Analysis. Results of the study revealed that the combination of Centralized Secondary School Examination and Basic Education Certificate Examination predicted students' achievement in senior secondary certificate Mathematics. Also, each of the predictor variables (CSSE and BECE) significantly predicted positive students' achievement in the SSCE Mathematics. It was concluded that the combination of CSSE and BECE significantly predicts students' achievement in SSCE Mathematics. It was recommended that both the Centralized Secondary School Examination and Basic Education Certificate Examination should be maintained as they are good predictors of students' achievements in senior secondary certificate Mathematics.

Key words: CSSE, BECE, predictor, students' achievement, Mathematics

Introduction

Mathematics is an essential tool that is very useful in many fields such as physical and biological sciences, Engineering, Medicine, Finance and Environmental sciences. Mathematics as a subject is relevant to virtually everyday activities of man. Both the

educated and non-educated are faced with Mathematics issues and manipulations as they run daily life activities. Usman and Ojo (2014) posited that the usefulness of Mathematics extends to other fields of human endeavor such as politics, stock market, finance and sports. This may be one of the reasons why the managers of the Nigerian educational system placed Mathematics as core subject for students both in primary school (basic education), Junior Secondary (Upper Basic Education) and Senior Secondary (post basic education) (Obioma, 2012).

Basic education was introduced in the year 2000 (Universal Basic Education, FGN, 2000). It is designed to run for 9 years, (six years of primary school and three years of junior secondary school) within these 9 years, the child is exposed to several subjects, the core subjects, the elective and the vocational or trade subjects. The aim of this education is to inculcate relevant skills necessarily for self-reliance, employment or further studies in the senior secondary school. At the end of the 9 years of education programme, the students are assessed through the Basic Education Certificate Examination (BECE). The examination replaced the junior secondary school certificate examination (JSCE). BECE is conducted by individual states of the federation including the federal capital territory (Ojerinde, 2011). Elishama (2014) posited that 5 credit pass including English and Mathematics qualifies a candidate of BECE to gain admission into the senior Secondary School. Students who perform well in BECE are expected to also perform well in WAEC, NECO or NABTEB senior certificate examinations.

It is clear that school achievement is indexed by means of examination. A child who passes basic examinations as in BECE is expected to pass external or public examinations as prepared by NECO, WAEC and NABTEB. To further prepare students for the external examinations, school administrators design several ways to prepare the students for these external examinations. The Imo state government being abreast of this introduced the Centralized Secondary School Examination (CSSE) in 2006 as an internal mechanism for assessing students' preparedness for the external examination. The basic aim of introducing this examination is to assess quality of students to be presented for public examinations (Imo state Ministry of Education, 2016). To this end, the CSSE examination is presented to students at the third term of senior secondary 2. Those that passed the examinations are promoted to senior secondary 3 and are deemed fit for the public end of school examinations (WAEC, NECO or NABTEB). The organization, preparation, administration and scoring of the CSSE examination is consciously carried out in a professional manner so as to reflect what is obtainable in the public examination. Hence this study wants to ascertain the extent these assumptions are true in relation to CSSE and GECE predicting SSC Mathematics achievement.

This study has been billed to take its bearing from the theory of prediction introduced by John Dewey in 1960. The theory states that learning occurs through experience and the quality of education requires that learning must be built on previous knowledge and experiences. For Dewey, the value of an experience is linked to the effect it has on an individual present, future and the extent to which it allows them to actively contribute to the society. This implies that if students obtain good Mathematics grades in BECE and CSSE, it is believed to lead to good Mathematics grades in SSCE (positive reinforcement).

If grades are low or students fail, they likely to have low grades or fail in their SSCE and this Skinner referred to as undesirable condition. A number of related studies abound in literature. .

Esomonu and Ogbozulu (2019) investigated how students' grades in BECE predicted grades in WAEC in English Language, Mathematics and Igbo Language subjects in Anambra State, Nigeria and it was found that 84.1% of student' grade in WAEC English Language was predicted by their grades in BECE English, 49.2% of students 'grades in WAEC Mathematics was predicted by their grades in BECE Mathematics while 88.7% of students grade in WAEC Igbo Language was predicted by their grades in BECE Igbo Language. Opera, Ijeoma and Uchechi (2017) investigated the ability of basic science performance in junior secondary school certificate examinations to predict performance in senior secondary school examination in Physics, Chemistry and Biology in Abia state, Nigeria. The findings revealed that JSCE basic science predicted performance of students in WAEC Physics, Chemistry and Biology. This finding meant that the higher BECE scores and CSSE scores brought about the high academic achievement. While low BECE and CSSE scores were responsible for low score in WAEC. In a similar but earlier study by Ugwuda and Abayomi (2014) and Adeyemi (2008) it was equally discovered that JSC examinations were good predictor of performance at SSC examination.

Also, Edokpayi and Suleiman (2011) investigated the junior secondary school certificate examination in integrated science in predicting students' performance in senior secondary school certificate examination in chemistry in Zawa metropolis, Nigeria and found out that academic achievement of students in Integrated Science JSCE among selected secondary schools in the study area were poor predictors of later achievement in chemistry senior secondary school certificate examination (SSCE) while Obajemu (2016) investigated the extent to which transition mock examination predicts students' achievement in SSCE in Kabba/Bunu and Mopamuro local government area of Kogi state and it was found out that transition and mock examinations are good predictors of SSCE Mathematics.

Kolawole and Ala (2013) study revealed that continuous assessment scores on students' performance in Mathematics in South West Nigeria has a positive significant influence of actual aggregate continuous assessment and examination on final scores. Also, Omiri and Ale (2008) discovered that mock examination predicted SSC examination in Mathematics. The purpose of this study was to find out how CSSE and BECE predict students' achievement in SSCE Mathematics.

Hypothesis

Centralized Secondary School Examination (CSSE) and Basic Education Certificate Examination (BECE) do not significantly predict Mathematics achievement scores among SSCE students at 0.05 level of significance.

Methodology

The design adopted for the study was correlation research design. This design was appropriate for the study because the study seeks to establish the relationship between two

or more variables and also to examine how the predictor variables relate with the criterion variable in the study. The population of the study comprised 33,074 Senior Secondary 3 students of 2017/2018 in the 297 public secondary schools in Imo state. The sample for the study was 850 students drawn from 8 secondary schools in Imo State selected through simple random sampling technique done in a multi stage form. Simple random sampling technique was used to select four education zones in the state and then two local governments were sampled from each educational zone. From the selected local governments one secondary school was obtained from each of the 8 local governments.

All the SS3 students in each sampled school were used. Three instruments were used for the study; the first was CSSE 2017 result sheets/ records of students' achievement in Mathematics from which students' scores were obtained. The scores obtained were translated to a nonlinear letter grade; thus 0-39 "F" with assigned score of 1, 40-49 "D" with assigned score of 2, 50-59 "C" with assigned score of 3, 60-69 "B" with assigned score of 4, 70-100 "A" with assigned score of 5. The second instrument was BECE 2016 result sheets/ records of students' achievement on Mathematics from which students' scores were obtained. Figures were assigned to each of the non-linear 4-point scale A, C, P, and F thus 4, 3, 2, and 1. The third instrument was WAEC result sheets/record of 2018 students' achievement scores in Mathematics. Figures were assigned to each of the stanine grades A1, B2, B3, C4, C5, C6, D7, E8, F9 in the reversed order thus 9, 8, 7, 6, 5, 4, 3, 2, 1. The hypothesis was tested at 5% significant level using multiple regression analysis technique to obtain a regression equation in the form;

$$ACC = a + CSSEX_1 + BECEX_2.$$

The hypothesis was tested in two dimensions- the composite predictive dimension and the relative predictive dimension.

Results

H_0 : Centralized Secondary School Examination (CSSE) and Basic Education Certificate Examination (BECE) do not significantly predict Mathematics achievement among senior secondary students. The results are presented in table one and two

Table 1: ANOVA Table of the Composite prediction of CSSE and BECE on students' Mathematics achievement

Source of variation	SS	DF	MS	F	P-value
Regression	1393.066	2	696.533	513.185	0.000
Residual	1149.611	847	1.337		
Total	2542.678	849			

The table 1 shows that the obtained probability value (0.000) with the computed F- value (513.185) was less than 0.05 level of significant. This means that there is a composite prediction of Mathematics achievement using CSSE and BECE. That is, effectiveness of

the predictor variables in predicting SSCE achievement could not have occurred by chance.

From the Model Summary of SPSS Output, Multiple R = 0.740, R square (coefficient of determination) = 0.548 and Standard error = 1.165. This means that 54.8% of the variance in SSCE Mathematics achievement by combined variances in students CSSE and BECE scores

Table 2: Relative prediction of CSSE and BECE on students' Mathematics achievement.

Variables	B	Std. Error	Beta	T	P-value
Constant	0.155	0.172		7.903	
CSSE	0.056	0.004	0.488	13.480	0.000
BECE	0.036	0.004	0.296	8.186	0.000

Result in table 2 are on the relative prediction of CSSE and BECE on students' Mathematics Achievement in SSCE. From the result, each of the predictors variable (CSSE and BECE) significantly predicted positive performances in the SSCE on Mathematics (t = 13.480 and 8.186 for CSSE and BECE respectively).

The result also shows that each of the predictor variables correlated positively with academic achievement (B: 0.488 and 0.296 for CSSE and BECE respectively). Based on the results, the following prediction equation was obtained for the study:

$$ACC = 0.155 + 0.056_{CSSE} + 0.036_{BECE}$$

Discussion

The findings of the study indicate that a combination of the predictor variables (CSSE and BECE) significantly predicted the academic achievement in Mathematics of SSS 3 students. That is, the higher the score in CSSE and BECE, the higher their performance in SSCE and vice versa. These finding is expected because a child who passes basic examinations as in BECE is expected to pass external or public examinations as prepared by NECO, WAEC and NABTEB all things being equal. On the other hand, the Imo Etate Government primarily introduced the Centralized Secondary School Examination (CSSE) in 2006 as an internal mechanism for assessing students' preparedness for the external examination. This finding is in conformity with the findings of Esomonu and Ogbuzulu (2019) and Opera, Ijeoma and Uchechi (2017), that JSE predicted performance in WAEC examination. The findings is also in line with the findings of Ugwuda and Abayomi (2014) and Adeyemi (2008), that JSC examination were good predictor of performance at SSC examination. The second findings of this study were that, each of the two predictors, predicted students' achievement in the SSCE positively with CSSE having the highest positive relationship with academic achievement followed by BECE. This finding is in consonance with other studies like Obajemu (2016); Kolawole and Ala (2013); Ominri and Ale (2008); Obioma and Salau (2007) that there was a

significant between Mock and WAEC in Mathematics.

Conclusion

The findings of the study has shown that, the higher the scores of student' in CSSE and BECE the higher the students' scores in Mathematics in SSC examination. It was concluded that the combination CSSE and BECE significantly predicts students' achievement in SSCE Mathematics.

Recommendation

It was recommended that both the Centralized Secondary School Examination and Basic Education Certificate Examination should be maintained as they are good predictors of students' achievements in senior secondary certificate Mathematics.

References

- Adeyemi, T. O. (200 in Kogi State. *Unpublished master's thesis, University of Nigeria, Nsukka*
- Obioma, G.O. (2012). *9-year basic education curriculum*. Abuja: NERDC Press.
- Ojerinde, D. (2011). *Public examinations in Nigeria*. India: Melrose Educational Books and Pub Ltd.
- Ominri, M.S. & Ale, V.M. (2008). Predictive validity of English and Mathematics mock examination results of Senior Secondary School students' performance in WASCE in Ekiti State, Nigeria. *Pakistan Journal of Social Sciences*, 5(2), 139-141.
- Opara, A., Ijeoma, M.C., & Uchechi, S. (2017). Basic Science Junior School Certificate Examination results as predictors of Senior School Certificate Examination in Physics, Chemistry and Biology in Aba Metropolis of Abia State, Nigeria. *IOSR Journal of Research Method in Education*, 7(6), 32-38
- Ugwuda, S.O. & Abayomi, O.S. (2014). Predictive validity of NECO JSCE on students' achievement in NECO-SSCE Examination. *Journal of the Science Teachers' Association of Nigeria*, 48(1), 95-103
- Skinner, B.F. (1940). *Operant Conditioning. Simply Psychology*. Retrieved from <https://www.simplypsychology.org/operant-conditioning.html>.
- Usman, K.O., & Ojo, S.G. (2014). Mathematics Education: A Tool for National Competitiveness and Prestige. *Journal of the Mathematical Association of Nigeria* (abacus), 39(1), 97-105.

ASSESSMENT SCHOOL MARKS' INTERPRETATIONS AND REPORTING PRACTICES IN 21ST CENTURY AMONG PRIMARY SCHOOLS IN NSUKKA EDUCATION ZONE, ENUGU STATE

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Abstract

The study explored school marks' interpretation and reporting practices among primary schools in Nsukka Education Zone, Enugu State. Descriptive survey research design was adopted for the study. The population for the study was 500 head teachers distributed in 500 primary schools in the Zone. The sample size was 217 head teachers, comprised 104 public and 113 private schools' head teachers. Stratified random sampling technique was used for selection of respondents for the study. Two research questions and one hypothesis guided the study. "School Marks' Interpretation and Reporting Practices Questionnaire (SMIRPQ)" was the instrument for data collection. Mean, standard deviation and t-test statistics. The findings revealed that traditional school marks' interpretation and reporting practices is common among the primary schools in the zone and that there is a significant difference in school marks interpretation and reporting practices between public and private schools. It was recommended, among others, that schools should avoid the use of traditional school marks' interpretation and reporting practices, rather schools should embrace innovative approaches, such as the use of standard scores in school marks' interpretation and reporting practices.

Key words: Education, Assessment, standard scores, school mark

Introduction

Changes in a learners' behavior is an integral part of teaching and learning which can be determined through assessment. Assessment of learning outcomes is needed to ensure accountability; since it is the responsibility of schools to furnish students and parents with learning progress of the students. There will be no accountability without assessment. According to Kizlik (2014) assessment is a broad term which can be seen as a process by which information is obtained relative to some known objective or goal. It is also seen as a term that connote all the procedures for gathering information about students' learning outcomes and interpretation of the information for the solely purpose of enhancing learning. According to Nworgu (2015) assessment is a broad term that encompasses both measurement and evaluation. In other words, assessment is not only concerned with gathering information, but also is concerned with making value judgments on the information. Periodically gathering of information about students' learning is essential part of continuous assessment which is expected of every teacher. It has been noted that effective utilization of continuous assessment contributes greatly in ensuring

quality education (Sintayehu, 2016). In determining students' learning progress, assessment could be formative or summative.

Formative assessment, also known as assessment for learning, refers to assessment that takes place during instruction. Formative assessment could be in form of classroom questioning, short test, and small group discussions which take place in the classroom. Formative assessment enables immediate feedback concerning students' learning. Through formative assessment, teachers can change their teaching tactics during instruction to achieve desired objectives. Good formative assessment makes teaching and learning more efficient. It facilitates and compliment summative assessment of learning.

Summative assessment (assessment of learning) is concerned with description and summarization of what learners have learnt at the end of instruction or at the end of a programme. Assessment of learning could be short term or long term depending on the scope of the assessment. It could be a short-term when it is used for summarizing learning after classroom instruction. On the other hand, it could be a long-term, if it aims, at summarizing learning at the end of a programme or schooling. In most primary schools in Nigeria, what the students have learnt at the end of an academic term is measured in part by the students' continuous assessment scores during the term and in part by the end-of-term examination scores.

Examination scores are taken very seriously by school administrators, teachers, students and parents because employers and the public lay more emphasis on grades that emanate from examination scores (Soh, 2013). There seems to be a controversy on the use of the terms grades and marks. Yasbeck (2011) noted that the meaning of grades has continued to be controversial in recent studies. Marks and grades are terms that are used for describing students' academic achievement. According to Nworgu (2019) grading involves marking or scoring of students' scripts or answers which results in assignment of numerical values, letters or adjectival label such as pass, excellent or fail. Yasbeck (2011) defined grades as the actual score or mark which is assigned to students based on the decision making of the assessment. In this study, school marks connote the use of letters, numerical values and adjectival terms for interpretation of primary school pupils' progress.

School marks can be interpreted using traditional or modern grade framework. Under traditional grade framework, there is always one summative grade for each student (Hanover Research [HR], 2016). In traditional school mark interpretation practices, for example, teachers interpret students' performance based on percentage of examination questions answered correctly. A student who answers all the questions correctly in an examination whose total score is 100 assigned a mark of 100. A student who answered 40% of the questions is assigned a mark of 40. Since under traditional grade framework, the mark a student obtains depend on the number of examination questions set for the students and difficult of the questions, it become a challenge comparing a student's performance in two different subjects or even performances of two students from different schools on a particular subject. Under traditional approach, pupils' overall scores in terminal examination are obtained by adding marks from different subjects and ranking

the overall scores. These practices have been misleading in the interpretation of school marks.

There are many misinterpretations of school marks associated with traditional grade framework. To have a fully understanding of these misinterpretations of scores, consider a student who obtained a mark of 75 in Mathematics and 65 in English language. Because the mark, 75 is greater than 65, most parents would quickly conclude that the student performed better in Mathematics than in English. However, the two scores do not make any meaning on their own, unless, we get more information on the distribution scores where the two scores came from. Concisely, the means and standard deviations of the distribution of scores in Mathematics and English must be known before it can be said that a student performed better in one subject or the other. The approach of interpreting school marks based on the class average and class standard deviation is within what is referred to in this paper as the modern grade framework for interpretation of school marks. The class average and standard deviation provide a conceptual tool for effective school marks' interpretation. It has been noted that if the conceptual tools needed for tests interpretations are not available to test users, interpretation would be improper; and decisions will be irrelevant or even misleading (Soh, 2013). A score obtained from a distribution with known mean and standard deviation is referred as standard score.

A standard score is derived from raw scores using norming information gathered when test was developed. It seems that most schools in Nsukka Education Zone prefer ranking their students based on their raw scores. Parents seem to derive joy when their children are announced as the first or second position in the class when it comes to examinations. Unfortunately, a student who is ranked as the first position using raw scores obtained from different subjects, may not necessarily performed better than a student who is ranked second. The reason being that rank does not indicate how far above or below mean scores of the distribution an individual score falls using common scale.

Because standard scores take variance into account, it can be used to compare scores of individuals from different ages, groups, grades or even subjects. For instance, suppose, the class average scores of a student in English and Mathematics are 32 and 75 with standard deviation of 10 and 16 respectively. The means are comparable and the standard deviations are also comparable since they represent average achievement of the same students on different examination. A point one standard deviation below the mean on English test would be $32 - 10 = 22$. Similarly, one-point standard deviation below the mean on mathematics test would be $75 - 16 = 59$. These two points, 22 and 59 are comparable since they represent the same relative attainments. Other points can be worked out all along the scale and comparison could be conveniently made. Supposed Obi obtained scores of 36 and 80 in the two tests, that is English and Mathematics, Obi's score of 36 in English is 4 points ($36 - 32 = 4$) above the mean score. Since a point one standard deviation on English test is 10, then the 4 score points above the mean will give $4 \div 10 = 0.4$ point standard deviation above the mean. Similarly, in Mathematics, Obi scored 5 points (that is, $80 - 75 = 5$) above the class mean. Since a point one standard deviation on mathematics test is 16 mark then, 5 marks would give 0.31 standard deviation unit above the mean. Since the values 0.40 and 0.31 are expressed as the mean and standard deviation of two

distributions, they could be compared directly. Therefore, it can be seen that Obi performed slightly better in English than in mathematics. The technique demonstrated in comparing Obi's two scores from different test is the principles that guide the use of standard scores.

One important and the oldest type of standard score is the Z-score (Coolidge, 2006). Z-scores permit description of raw scores in terms of their distances from the mean when measured in standard deviation unit; and thereby allowing comparison of different kinds of variables by standardizing the distribution (McLeod, 2019). The mean and standard of z-distribution are 0.00 and 1.00 respectively. The implication is that students' performance can be reported even with negative numbers, zeros and in decimals. For instance, a student who obtained an average mark is said to have a Z-score of zero. one problem associated with Z score is that associated with z scores is the presence of negative values. A student who is performing below the average mark in a test will obtain a Z-score with negative values. Parents would not be comfortable hearing their kids returning -1.50 score in Mathematics examination. It has to be noted Z-scores have decimals, and it is often inconvenient to work with decimals. Despite the shortcomings of Z-score, the initial steps in converting any raw score into any other kind of standard scores centers on the Z-scores.

The calculation of Z-score can be generalized in the formula: $Z\text{-score} = \frac{X - M}{\sigma}$ where X = raw score, M = mean score, σ = standard deviation. if the score obtained by 10 students in a mathematic examination is listed thus: 67, 74, 77, 81, 85, 89, 92, 93, 94 and 99. A teacher can convert these scores to z-scores by first, finding the mean and standard deviation of the scores. The mean and the standard deviation of the scores are $M = 85.10$ and $\sigma = 10.17$ respectively. For the raw score of 67, the $Z\text{-score} = \frac{67 - 85.10}{10.17} = -1.78$, similarly the Z-score of the other raw scores could be calculated. For the raw scores of 74, 77, 81, 85, 89, 92, 93, 94 and 99 are -1.78, -1.09, -0.80, -0.40, -0.01, 0.38, 0.68, 0.78, 0.88, and 1.37 respectively.

Apart from z-scores, other standard scores which could be used for effective interpretation of students score are the T-scores, stanine scores and percentile rank. Converting Z-scores to these other types of standard scores does not require much statistical or mathematical computation. Apart from percentile ranks, a teacher can convert z-scores to some other types of standard score by using the general formula: $Z' = \bar{x} + (z \text{ score})$, where Z' = the new standard score that you are trying to find, $\bar{x}$ = the mean of the new standard scores, S' = standard deviation of the new standard score. When the mean of standard scores is 50 with standard deviation of 10, the standard scores are referred to as T-scores.

Therefore, transforming z-scores to T-scores is done through the formula; $T\text{-score} = 50 + 10 (z\text{-scores})$. The values obtained are rounded up to whole numbers. It expected that students' test scores could be interpreted in T-scores to eliminate the bad connotations associated with the minus signs, zero and decimals in the z-scores. Parents and test users will not find it much difficult interpreting T-scores. Teachers could equally convert z-scores to standard scores using any mean, say 75 and any standard deviation, say 15. In this case, the new standard score denoted by T' is given by $T' = 75 + 15 (Z\text{-score})$. It is advisable to adopt the conventional standard score which include percentile scores.

Percentile scores equally provide a very useful statistical tool for comparison of students' performances. Percentiles, according to Coolidge (2006), provide a ranking in terms of a percentage compared to a large group. To demonstrate how percentile rank could be computed, if a teacher wishes to convert the raw scores of a student who scored 92 in a test, and suppose that z-score associated with the raw score of 92 is 0.68. The area of the z-distribution (z-distribution is always available as an appendix to most statistic textbooks) is .2517. The students' score of 92 exceed not only this area from the mean (Z-0.00) but also all score below the mean (an area of 0.5000). The total proportion of scores exceeded by the students score is $0.2517 + .5000 = .7517$. To convert this proportion to percentage, multiply it by 100 which give 75 percentiles. The interpretation is that the student' score of 92 exceeds 75% of all the students' scores. In other words, the students score is exceeded by 25% of all the students' scores. It implies that the student performs better than 75% of the students in the class who took the test.

The benefits of interpreting and reporting students' school marks in standard scores should be the driving forces that surmount the little statistical and mathematical demand of computing standard scores. The use of traditional approach in reporting and interpreting students' academic progress has been in practice for years (Aitken, 2016), the culture can be through the use of standard scores in school marks interpretations and reporting. The use of spreadsheets, such as excel, could easily facilitate teachers' application of standard scores in interpreting students' test score and thereby providing parents reliable information concerning students' academic progress.

Examination scores are used by school and employers of labor for placement, selection, promotion or/and certification of examinees. For test users to make prudent judgments based on examinees' test scores, the judgment should be based on the parameters in which the test scores are interpreted. It is a common experience for parent to associate high raw score to high performance when comparing children's test performance. However, two students' tests scores can only be better and easily compared if the scores are reported in standard scores. In this 21st century, it is expected that schools should move away from traditional approach of interpreting and reporting and embrace innovative practices in school marks' interpretation. Interpretation and reporting of student's examination performance in standard score has been recommended by experts, yet not much is known on school application of standard scores in interpreting and reporting pupils' school marks. The thrust of this study, therefore, is to determine the school marks' interpretation and reporting practices among primary schools in Nsukka education zone, Enugu State with a special focus on standard scores. Specifically, the study sought to:

1. identify school marks interpretation and reporting practices among primary schools in Nsukka Education Zone.
2. determine the difference in the school marks interpretation and reporting practices public/private primary schools in Nsukka Education Zone.

Research Questions

The following research question guided the study:

- i. what are the school marks interpretation practices among primary schools in

- Nsukka Education Zone?
- ii. what is the difference on schools' marks interpretation reporting practices between public and private primary schools in Nsukka Education Zone?

Hypothesis

There is no significant difference between the means school mark interpretation practices of public and private primary schools.

Methodology

The study adopted descriptive survey design. Descriptive survey design according to Nworgu (2015) aims at collecting data on, and describing in a systematic manner, the characteristics, features or fact about a given population. The population of the study was 500 primary schools' head teachers distributed in the 500 primary schools (comprised 261 private and 239 public schools' primary schools) in Nsukka education zone. Primary school's pupils were used in this study, on the assumption that, when pupils' school marks are correctly interpreted, the pupils will be effectively placed and guided in their subsequent academic endeavors. The sample size was 217 head teachers (comprised of 104 public primary schools' head teachers and 113 private primary schools' head teachers). The sample size was chosen based on Cohen, Manion, and Morrison (2007) recommendation for sample size determination. Stratified random sampling technique was used in selecting 104 public primary schools' head teachers and 113 private primary schools' head teachers in such a way that one head teacher was selected from each school. The instrument for data collection was "School Marks Interpretation and Reporting Practices Questionnaire (SMIRPQ)" developed by the researchers. The SMIRPQ was scored on 4-point scale as follows: Strongly Agree=4, Agree=3, Disagree=2 and Strongly Disagree = 1. The instrument was validated by three experts in Educational Measurement and Evaluation from Department of Science Education, University of Nigeria, Nsukka. The SMIRPQ has two sections. Section A which contains demographic information about school and section B which contains 10 items that measure school marks interpretation and reporting practices among primary schools. The reliability of the instrument was determined using Cronbach Alpha after trial testing. The internal consistency reliability coefficient was 0.88 which indicated strong reliability of instrument. Method of data collection was on-the-spot administration and collection of the instrument by the researchers. Collected data were analyzed using mean and standard deviation, and t-test statistic. A mean rating score of 2.5 and above indicate an agreement with school mark interpretational practice while a mean rating less than 2.5 indicate disagreement. The two research questions were answered using mean and standard deviation while the hypothesis was tested using a t-test statistic.

Results

Research Questions One: what are the school marks interpretation practices among primary schools in Nsukka Education Zone?

Table 1: Mean and Standard Deviation of School Marks interpretation Practices among Primary Schools in Nsukka Education Zone

S/N	Statements	N	Mean	Std. Dev.	Remarks
1.	In my school, examination marks from different subjects are added to determine pupils' overall relative positions.	217	3.78	.41	Agreed
2.	In my school, pass mark are fixed to either 40% or 50%.	217	3.86	.94	Agreed
3.	In my school, adjectives such as Excellent, Very Good, Good, Fair, Poor or Fail is used in interpreting pupils' marks.	217	3.56	.87	Agreed
4.	Class average on each subject is included on pupils' report cards in my school.	217	2.34	.78	Disagree
5.	In my school, the class standard deviation mark is reported on each subject	217	1.22	.30	Disagree
6.	In my school, how far pupils' marks are below or above the class average, is reported on each subject	217	1.09	.97	Disagree
7.	In my school, pupils' relative positions are determined using simple rank	217	3.82	.98	Agree
8.	In my school, pupils school marks are interpreted and reported in percentile scores	217	1.21	.18	Disagree
9.	In my school, pupils' school marks are transformed and reported in Z-scores.	217	1.02	.36	Disagree
10.	In my school, T-scores are used in reporting pupils' school marks	217	1.35	.64	Disagree
	Grand Mean		2.23	.64	

From Table 1, the teachers and school head teachers' responses on their adoption of school marks interpretation practices can be seen. The respondents agreed on their adoption of school marks interpretation practices on items 1-3 and 7 with mean and standard deviation ranging from 3.56 to 3.85 and standard deviation ranging from 0.41 to 0.98 respectively. The respondents disagree on their adoption of school marks interpretation practices on items 4 - 6 and 8 - 10 with means ranging from 1.02 to 2.34 with standard deviation ranging from 0.18 to 0.78 respectively.

Research Question Two: what is the difference on schools' marks interpretation reporting practices between public and private primary schools in Nsukka Education Zone?

Table 2: Mean and Standard Deviation of School Marks Interpretation Practices for Public and Private Schools in Nsukka Education Zone.

S/N	Items	School-Type	N	Mean	Std. Dev
1	In my school, examination marks from different subjects are added to determine pupils' relative positions.	Public Schools	104	3.51	.50
		Private School	113	3.67	.47
2	In my school, pass mark are fixed to either 40% or 50%.	Public Schools	104	3.18	.38
		Private Schools	113	4.00	.01
3	In my school, adjectives such as Excellent, Very Good, Good, Fair, Poor or Fail is used in interpreting pupils' marks.	Public Schools	104	3.79	.41
		Private Schools	113	4.20	.02
4	In my school, Class average on each subject is included on pupils' report cards.	Public Schools	104	2.69	.63
		Private Schools	113	2.56	.49
5	In my school, the class standard deviation mark is reported on each subject	Public Schools	104	1.09	.28
		Private Schools	113	1.56	.49
6	In my school, how far pupils' marks are below or above the class average, is reported on each subject	Public Schools	104	2.48	.82
		Private School	113	3.44	.32
7	In my school, pupils school marks are interpreted and reported in percentile scores	Public Schools	104	1.40	.05
		Private Schools	113	1.33	.47
8	In my school, pupils' school marks are transformed and reported in Z-scores.	Public Schools	104	1.20	.39
		Private Schools	113	1.42	.28
9	In my school, T-scores are used in reporting pupils' school marks	Public Schools	104	1.06	.12
		Private Schools	113	1.33	.47
10	In my school, pupils' relative positions are determined using simple rank	Public Schools	104	3.70	.65
		Private Schools	113	3.67	.41
Cluster Mean and SD		Public schools		2.37	.39
		Private Schools		2.72	.36

The results in Table 2 shows mean school mark interpretation practices of public and private schools. On item 1, the mean school marks interpretations and reporting for public and private schools are 3.51 and 3.67 with standard deviation of .50 and .47 respectively. For item 2, the mean school marks interpretations and reporting practices for public and private schools are 3.18 and 4.00 with standard deviation of .38 and .01 respectively. On item 3, the mean school marks interpretations and reporting practices for public are 3.79 and 4.20 with standard deviation of .41 and .02 respectively. On item 5, the mean school marks interpretations and reporting practices for public and private schools are 1.09 and 1.56 with standard deviation of .28 and .49 respectively. For items 6-10, the mean school marks interpretation and reporting practices for public schools ranges from 3.70 to 1.06

with standard deviation ranging from .65 to .05 while the mean for private schools ranges from 3.67 to 1.20 with standard deviation ranging from .47 to .12. It appears that there is no significant influence of school-type on school marks interpretation practices among primary schools in Nsukka Education Zone.

Hypothesis One: there is no significant difference between the means school mark interpretation practices of public and private primary schools.

Table 3: t-test summary table of difference in the means school marks interpretation practices among primary schools

variable	N	Mean	SD	df	t-calc.	t-crit.	Decision
Public School	104	2.37	0.39	215	6.86	1.65	Significant
Private School	113	2.72	0.36				

The result in Table 3 shows that the calculated t-value is 6.86 is greater than the t-critical value of 1.65 at 215 degree of freedom. The null hypothesis was therefore rejected and it shows that there was a significant difference in the means school marks interpretation and reporting practices between public and private schools in favor our private schools in Nsukka Education Zone.

Discussion

The findings of the study based on research question one revealed that traditional school marks interpretation practices are mostly adopted by primary schools in Nsukka Education Zone. These traditional school marks interpretational practices are addition of school marks from different subjects to determine pupils' overall school mark, the use of simple rank in determine pupils' relative positions, arbitrary fixing of pass marks to 40% or 50% and the use of terms such as 'excellent', 'fair', 'good' and 'poor' for interpretation of school marks. The findings equally revealed that modern school marks interpretation practices, such as the use of percentile ranks and Z-scores and T-scores are not adopted by the schools in the zone for interpretation of school marks. The reason could be that 'traditional letter grades have been around for over 100 years and to change a culture so ingrained in schooling will be very difficult to say the least' (Aitken, 2016, p.26). It could also be attributed to unwarranted phobia for statistics among teachers that has made the teachers not to apply group of statistics known as measures of relative standing in interpretation of pupils' school marks. These findings are in line with Nwana (as cited in Nworgu, 2019) that common misinterpretation of school marks is embedded on the use of arbitrary pass marks, addition of unweighted marks from different subject and equivalence of equally separated marks.

The study also revealed a significant difference in inclusion of class average of each subject on pupils' report card between public and private schools. This difference is in favour of private school. The study reveals a significant difference between public and private school on other school marks' interpretation practices in favour of private schools adopting more robust school marks interpretation practices. The observed significant difference could be that some private schools might have designed their own report card

and emphasized the inclusion of class average. The findings are in consonance with Faleye and Adefisoye (2016) who noted a significant classroom assessment practice between private and public secondary schools.

Conclusion

Based on the findings of the study, it is concluded that traditional school marks' interpretational practices are adopted among primary schools in Nsukka Education Zone; and that standard scores are hardly adopted in school marks' interpretation and reporting. It is concluded that private schools significant include class average of each subjects on pupils' report cards than the public schools.

Recommendations

The following recommendations were made based on the findings of the study:

1. Primary school teachers should move away from the use traditional school marks interpretation practices and embrace the use of percentile ranks and standard scores.
2. The use of school marks interpretation adjectives such as 'excellent', 'very good', 'fair' and 'poor' should be made on students tests standard scores and not on raw scores.
3. Government should organize conferences, seminars and workshops for teachers on how to apply modern school marks interpretation practices.
4. Lecturers in Educational Measurement Evaluation should lay more emphasis on students' conceptual understanding and application of measures of relative standing or position
5. Primary school pupils' report cards should be redesigned to class average, percentile rank and T-scores.

References

- Aitken, N. (2016). *Grading and reporting*. In Scott, S., Donald, E. D. and Charles, F. W. (eds.). *Assessment in Education*. Heidelberg: Springer International Publishing. Retrieved from researchgate.net/publication/3003491_Grading_and_Reporting_Student_Learning.
- Cohen, L., Manion, L.& Morrison, K. (2007). *Research methods in education (6th ed)*. London and New York: Routledge Taylors and Francis Group.
- Coolidge, F. L. (2006). *Statistics: A gentle introduction (2nd ed.)* New Delhi, 110047 India: Sage Publication.
- Esere, M. O., & Idowu, A. I. (2010). Continuous assessment practices in Nigeria: A review *International Association for Education Assessment. 36 Annual Conference*. Retrieved from <https://iaea.info/documents/continuous-assessment-practice-in-nigeria-schools-a-review/>
- Faleye, B. A., & Adefisoye, B. T. (2016). Continuous assessment practices of secondary school teachers in Osun State, Nigeria. *Journal of Psychology and Behavior*

Science, 4(1), 44-55.

- Honover Research (2016). *Best Practices for equity in grading*. Retrieved from gssaweboorg/wp-content/uploads/2016/05/Best-Practice-for-Equity-in-Grading.pdf
- Kizlik, B. (2014). *Measurement, Assessment and Evaluation in Education*. retrieved from [https://www.cloud.edu>assets? pdf](https://www.cloud.edu/assets? pdf).
- McLeod, S. (2019). Z-score : *definition, calculation and interpretation*. Retrieved from <https://www.simplypsychology.org/z-score.html>
- Nworgu, B. G. (2019). *Educational measurement and evaluation: theory and practice (2nd Ed.)*. Nsukka, Enugu: University Trust Publisher.
- Nworgu, B.G. (2015). *Educational research: Basic issues and methodology (3rd ed.)*. Nsukka, Enugu State, Nigeria: University Trust Publishers.
- Sintayehu, S. B. (2016). The practice of continuous assessment in primary schools: The case of Chagni Ethiopia. *Journal of Education Research and Practice*, 7(31). Retrieved from <https://files.eric.ed.gov/fulltext/EJ1122538.pdf>
- Soh, K. C. (2013). How much can we trust test scores? *Hong Kong Teachers Centre Journal*, 12, retrieved from https://www.edb.org.hk/HKTC/download/journal/j12/HKTCJv12_11-B01.pdf
- Yesbeck, D. M. (2011). Grading practices: Teachers consideration of academic and non-academic factors. *Doctoral Thesis, Virginia Commonwealth University*.

**USING OF SCHOOL-BASED ASSESSMENT AND CONTINUOUS
ASSESSMENT FOR ASSESSING PERFORMANCE IN ORAL ENGLISH IN
SECONDARY SCHOOLS IN OWERRI MUNICIPAL COUNCIL, IMO STATE**

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Abstract

A correlational study will illuminate and reveal whether the practice of School-Based Assessment (SBA) can either replace or complement that of continuous assessment (CA) when the characteristics, functions and rationales of both practices are laid down side by side for comparison. Therefore, this study is aimed at investigating whether the School-Based Assessment (SBA) could replace or complement Continuous Assessment (CA) in the evaluation of Oral English in the Secondary schools of Owerri Municipal Council of Imo State. It is a descriptive survey cum correlational design study with a Population of 222 English teachers and a sample of 110 from 12 secondary schools in the Council. Two research questions and one hypothesis guided the study. The instruments for data collection included a questionnaire and a rating scale constructed by the researchers captioned "School-Based and Continuous Assessment Characteristics, Functions and Rationale Questionnaire (SCACFRQ)" and "Rating scale on the Awareness of SBA by English Teachers (RSASET)". These were validated using the test-retest methods, and their reliability was established at 0.82 and 0.79 coefficients respectively. Means, standard deviations and correlation coefficients were determined to answer the research questions while the t-test of significance for correlation coefficient was used to test the hypothesis. The results of the study reveal that the extent of awareness (and hence practice) of SBA is low. There is positive but low correlation between SBA and CA, and that the correlation coefficient between the two techniques is not statistically significant. This implies that both SBA and CA should be used side by side (i.e. together). Recommendations were made to include that SBA should be used to complement CA in our educational assessment.

Keywords: School-based, Assessment, Oral English.

Introduction

School Based Assessment (SBA) is a standard-referenced broad-based assessment

procedure, the end of which is a summative evaluation of learners in a particular subject area. It was first proposed in the reform proposals for the Education System in Hong Kong, published in September, 2000. It was initially meant for use in the summative oral assessment component in the Compulsory English Language subject in the Hong Kong Certificate of Education Examination (HKCEE), a high-stake examination for all form 4-5 students (Davison, 2007). The reform proposal required that the modes, content and the assessment methods of public examination be reviewed, and that a core "Competence" approach similar to criterion-referencing would be adopted. (Hitherto, the HKCEE adopted the norm-referenced assessment system). Under this core-competence approach, basic skills and knowledge required by a form 5 graduate would be indicated and students would not have to compare with the others.

According to the information summarized from the Reform Proposals for the Education System in Hong Kong (HKEAA, 2005), under the education reforms in which a new culture of learning and teaching is to be cultivated, schools can use different modes of broad-based assessments including observations of students' performance in classroom and participation in project work to promote learning in a more flexible manner. The SBA would advocate students' all-round development which gives a more comprehensive picture of individual students' learning needs. It would foster the positive wash-back effects of public examinations. Again, it would help address the limitations of judging students on their performance in one single examination.

The rationales laid down by the SBA Consultancy Team (2005) for implementing SBA are

- Continuously assess students in a pressure-free environment
- Reduce reliance on public examinations
- Improve the reliability of subject assessment
- Reflect the standard and ability of students
- Foster teaching and learning
- Promote students' leisure reading and listening
- Reinforce learners' autonomy and independent learning
- Facilitate learning how to learn by carrying out peer reviews and writing after a model in assessment tasks and trainings
- Inform prospective employers and universities about the level of students
- Make Hong Kong's examination system in line with the international model so that assessment for learning is achieved
- Empower teachers to make part of the assessment mechanism.

For content sake, according to the SBA Consultancy Team (2005), the SBA component, worth 15% of the total HKCEE English mark, involves four assessments of English Oral Language skills based on texts - one from each category: print fiction, print non-fiction, non-print fiction, non-print non-fiction - drawn from a programme of independent extensive reading and viewing. Davison (2007) has it that at the time the SBA was introduced, students were required to choose at least four texts to read or view over the course of 2 years; keep brief notes in a logbook; and undertake a number of activities in and out of class to develop their independent reading, speaking and generic skills. Due to teachers' concerns over excessive workload, the requirements have been modified to "at least three texts over the course of 2 years".

Both SBA and Continuous Assessment (CA) are for the assessment of learners' performance. Assessment is an integral part of instruction, as it determines whether or not the goals of education are being met. Assessment affects decisions about grades, placement, advancement, instructional needs, curriculum and in some cases funding (Asuru, 2015). Elui, (2013) found that the use of one final examination administered at the end of the term, to determine student s' performances was said to be unfair and cannot give the true nature of individual child's ability because the reliability and validity in the assessment of each student's response to some of the workload were not completely objective but rested upon the standards and personal opinion of the scorers. Afuruobi, Anyanwu, Izuagba and Obiefuna (2010) highlighted the negative effects of the one-shot examination on both students and teachers to include; unidirectional assessment only in the cognitive domain, centering education on passing examination other than acquiring knowledge.

It was in pursuance of a sustainable solution to the above issues in Nigerian education assessment that a new system of education, the 6-3-3-4, was introduced in 1982. This was with a new form of assessing learning outcomes in all levels of Nigeria education known as Continuous Assessment (CA) as an innovation in Nigerian assessment system. According to Elui (2013), this new method of assessment was believed to take care of all aspects of learning as a better alternative to the traditional method of assessment because it will meaningfully involve the teacher and the learner during classroom interactions. The aspects of the new CA system that differentiates it from the old form of assessment include: removal of one-shot examination at the end of the Programme; ability of CA to reflect all the assignments, tests, projects, and classwork; it deemphasizes product and emphasizes the process approach to learning; and it takes care of some learning skills which are difficult to assess through tests (Ekwonye, Uzoma & Eguzo, 2015).

Continuous Assessment (CA) is the use of diverse instruments and sources to elicit and record information about learners at predetermined regular intervals throughout a course of study, in order to monitor their rate of progress in all the school subjects in the cognitive, affective and psycho-motor domains of learning (Nkwocha, 2009).

According to Ekwonye, Uzoma and Eguzo (2015), Continuous Assessment is a systematic process of evaluating periodically all the ramifications of behavior /learning of a child/student from the day he embarks on a course of study and throughout his period of learning in the school, with the aim of building up all records of all his activities/achievements (Physical, intellectual and emotional) which are used to assist him for optimum development. By this definition, CA is characteristically a systematic process which implies that it makes a controlled and meticulous observation of the learner in a periodic manner. It spans all the period of learning in the school right from the onset. According to Ekwonye *et al.*, it has meticulous programming which focuses on and comprehensively assesses all the behavior s/learning (cognitive, affective and psychomotor area) of the child in detail with a variety of instruments to obtain data or information on all areas of his learning activities. According to Okoroafor (2009), it involves setting of tests, administering the tests, giving assignments and home works, grading these tests and assignment results, giving examinations, scoring and recording

them, giving quizzes interviews, questionnaires, making observations, giving projects etc. CA emphasizes the totality of learning. Characteristically, CA is systematic, comprehensive and guidance-oriented.

Unfortunately, CA according to Elui (2013) has been experiencing an extreme deal of abuse and misinterpretation by teachers because most of them seem not to understand the purpose for CA in the school system. They have interpreted the policy to mean administration of monthly and bi-weekly tests in only the cognitive domain. This made CA to suffer from many problems like lack of consistency and validity (Elui, 2013).

Bassey, Akpama, Ayang and Iferi-Obeten (2013) and other authors have in view of some of the identified short comings of CA, advocated for its revision and introduction of School-Based Assessment (SBA) in the Nigerian system. According to Asuru (2015), SBA is an assessment practice that broadens and expands the form, mode, means and scope of assessment in the school in order to effectively assess the cognitive and non-cognitive domains of learning behavior s. It is a system for collecting periodic information on pupils' learning status for the purpose of planning improvement programmes in the performance of pupils as well as including the hidden curriculum as part of school actual curriculum. Asuru went further to assert that to ensure that learning takes place, the assessment base is broadened so that teachers and other significant persons that impact on the child's readiness, capacity and interest to learn are involved in the learning process.

The objectives of SBA as recorded include;

- To include the concept of the hidden curriculum as part of school core curriculum
- Assess and develop students' non-cognitive characteristics
- Provide an opportunity for the child to assess himself
- Incorporate some components of mastery learning like peer tutoring and peer assessment
- Aim at making the child to develop interest in learning

A study was carried out by Nworgu and Elian (2015) captioned; "Teachers Practice of SBA Techniques in Science Classes". The study was aimed at examining the practices of SBA techniques in science classes in senior secondary schools in Benue State. The result of the study revealed that the practice of SBA techniques is very low and the teachers were of the opinion that SBA practice slows down teaching, is difficult to implement and has an unknown cope and is time consuming. It was also revealed that the teachers are not totally clear about the fundamentals of SBA practices. Another study was carried out by Obilor, Ozim and Ezeala (2018) and titled: "Requirements for the implementation of SBA in Public Secondary Schools in Rivers State. The study revealed that knowledge of feedback and reinforcement was needed for carrying out SBA in the research, area. Another study was carried out by Yem (2012) titled; "Teachers' Perception of SBA in Nigerian Secondary School". The result indicated that more than half of the sampled teachers were not adequately prepared to conduct SBA. However, teachers from Federal Government Colleges were better prepared. It was also discovered that more than fifty percent of the teachers have negative perception of the effect of SBA on their teaching practices and on students' learning.

The purpose of this study is to correlate the characteristics, functions and rationales of both School-Based Assessment and Continuous Assessment so as to find out whether these assessment devices could complement each other or replace each other. The specific objectives for this purpose are to:

Examine the level of awareness of SBA

Find the correlation level between the characteristics, function and rationales of the SBA and CA, so as to know if one can replace the other.

The study is guided by the following research questions;

What is the level of awareness of the SBA among the English Language Teachers of Secondary Schools in Owerri Municipal Council?

What is the correlation coefficient between the characteristics, functions and rationales of the SBA and those of CA?

The hypothesis to further guide the study is:

The coefficient of correlation between the characteristics, functions and rationales of SBA and those of CA is not statistically significant ($p < 0.005$).

Method

Descriptive survey cum correlational research design was employed in this study. A total of 222 English Language teachers from the 12 secondary schools of Owerri Municipal Council constituted the population of the study. A sample of 110 teachers was drawn from this population using cluster and simple random sampling technique. Two research questions and one hypothesis guided the study. The instruments for data collection included a questionnaire and a rating scale constructed by the researchers captioned: "School-based and Continuous Assessment Characteristics, Functions and Rationales Questionnaire (SCACFRQ)" and "Rating Scale on the Awareness of SBA by English Teachers (RSASET)". The questionnaire was responded to by the English Teachers while the rating was done by the researchers. These were validated and their reliabilities established at 0.82 and 0.79 coefficients via the test-retest methods. The research questions were answered using means, standard deviations and correlation coefficients while the hypothesis was tested at 0.05 level of significance using t-test of significance of the coefficient of correlation. These were done after the return of the copies of the questionnaire and rating scales which were administered one-on-one to the teachers.

Results

Research Question 1: What is the level of awareness of the SBA among the English Language Teachers of Secondary Schools in Owerri Municipal Council?

Table 1: Extent of Awareness of SBA

S/N	Item Statement	Σfx	$\bar{x}$	S	DEC
1.	Knowledge of other assessment devices apart from CA	204	1.9	0.006	Low
2.	Knowledge of School-Based Assessment (SBA)	201	1.8	0.07	Very low
3.	Experience on the use of SBA	179	1.6	0.09	Very low
4.	Knowledge on CA as being better than SBA	229	2.1	0.04	Low
5.	Knowledge of SBA as being better than CA	247	2.2	0.03	Low
		$\Sigma \bar{x} =$	9.6		
Mean of means & Std. dv.			2.0	0.05	Low

Table 1 shows that the extent or level of awareness of SBA among the English Language Teachers is low since the cluster mean is 2.0 with a standard deviation of 0.05 as against a population mean of 2.5. Each of the five items of the cluster scored a mean below population mean.

Research Question 2: What is the correlation coefficient between the characteristics, functions and rationales of SBA and those of CA?

Table 2: Correlation between SBA and CA characteristics, functions and rationales;

S/N	Analysis Item	SBA		CA	
		NO	%	NO	%
1.	Comprehensive and broad-based assessment	95	86	70	64
2.	Relevance to Guidance and Counselling	102	93	108	98
3.	Record-Keeping oriented	80	73	100	91
4.	Related to formative evaluation	96	87	91	83
5.	Related to summative evaluation	93	85	92	84
6.	Systematic	61	55	96	87
7.	Cumulative	49	45	93	85
8.	Tests cognitive domain	104	95	103	94
9.	Tests affective domain	88	80	96	87
10.	Tests psycho-motor domain	70	64	90	82
11.	Reduction of chance factors on students' final grades	87	79	85	77
12.	Representative sample of students' ability	71	65	50	45
13.	Opportunity for diagnosing students' areas of strengths and weaknesses	90	82	83	75
14.	Teacher opportune to be involved in final grading or assessment	63	57	84	76
15.	Teacher diagnoses his defects in teaching methodology	71	65	88	80
16.	Remove one-shot and public examination	80	73	81	74
17.	Assessing students in a pressure-free environment	82	75	48	44
18.	Improve reliability of subject assessment	66	60	55	50
19.	Reinforce learners autonomy and independent learning	52	47	44	40
20.	Students are involved in project work	68	62	42	38
21.	Assessment is broad	85	77	56	51
22.	All-round development of students	76	69	61	55
23.	Use of peer views for assessment	96	87	32	29
24.	To standardize assessment globally	90	82	41	37
25.	Makes assessment more content-valid	81	74	53	48
		r = 0.29			

Table 3: Test of the significance of the correlation coefficient between SBA and CA

Variable	N	Df	R	t-cal	t-tab	SL	Decision
SBA	25	23	0.29	1.45	1.71	0.05	Not significant
CA	25						

From Table 3 above, a test of the significance of the coefficient of correlation, 0.29 shows

that the coefficient is not significant. This is because the t-calculated value of 1.45 is less than the t-tabulated value of 1.71 which made the null hypothesis to be accepted.

Discussion

The first finding of the study is that the extent of awareness of the English Language teachers in the Municipal Council is low. This implies that, many teachers (whether of English Language or not) are not aware of the practice of SBA as an assessment device. It is the CA that they are used to. Those who are aware of SBA do not practice it. This is in line with the findings of Nworgu and Ellah (2015) in Benue State that the practices of SBA techniques are very low and that the teachers were of the opinion that SBA practice slows down teaching, is difficult to implement and has unknown scope and is time consuming. In addition, the study revealed that the teachers were not totally clear about the fundamentals of SBA practices. In the same vein, Yem (2012) reported from his study that half of the sampled teachers in the public schools were not adequately prepared to conduct SBA and that more than fifty percent of the teachers had negative perception of the effects of SBA on their teaching practices and on students' learning.

The second finding is that there is low but positive correlation between the characteristics, functions and rationales of both SBA and CA. It was also found that the correlation coefficient between the two practices is not statistically significant. Hence, the low correlation coefficient would make one tend to suggest that the two techniques are not exchangeable (i.e. one cannot be used to replace the other), but that one can be used to complement the other. This is also buttressed by the technical reason of level of validity, reliability and fairness which are doubtful in SBA (Li, 2017). This may be the reason why Li (2017) was skeptical of SBA as he expressed that many teachers and students were concerned over validity, reliability and fairness as indices of quality of SBA component. According to Li, while teacher-educators and researchers view that SBA will enhance the validity and reliability of the HKCEE theoretically some frontline teachers and students are skeptical about this.

Conclusion

With the low awareness and practice of SBA in our school system as opposed to that of CA and with the low correlation coefficient between the two practices coupled with the insignificance of this correlation coefficient, SBA cannot be used to replace CA here. It can only be used to complement CA, where necessary until the whole process of SBA is visited with professional review expertise of curriculum experts and recommended.

Recommendations

The practice of SBA should be reemphasized in the Nigeria educational system and should be used together with CA.

The awareness of the practice and knowledge of the principles of SBA should be emphasized in our schools.

SBA should be used to complement CA if not in all the disciplines at least in some of them.

References

- Asuru, V.A. (2015). *Measurement and Evaluation in Education and Psychology*, Port Harcourt: Pearl Publishers International Ltd.
- Bassey, S.W., Akpama, E.G, Ayang E.E. & Iferi-Obeteri, M. (2013). The implications of the application of best characteristics: a case study of the Cross Rivers Central Senatorial District. *African Journal of Education and Technology*, 3(1), 37-45.
- Davison, C. (2007). Views from the chalkface: English Language School-Based Assessment in Hong Kong. *Language Assessment Quarterly*, 4(1), 37-68
- Ekwoye, E.G., Uzoma, P.N & Eguzo, G.O. (2015). *Introduction to testing and Continuous Assessment*. Owerri: Uzopietro Publishing Company.
- Elui, E.P. (2013). SBA in Nigerian Primary Schools. *Primary Education Studies*, 6(4), 30-36.
- HKEAA (2005). *Assessment Reforms for 2007 HKCEE Chinese and English Subject*. Hong Kong: HKEAA.
- Li, V. (2017). The New Assessment Paves Its Way. Retrieved from <http://plate.fed.cuhk.edu.hk/netter/...> 3rd July, 2020
- Nkwocha, P.C. (2009). *Educational Measurement and Evaluation for Effective Teaching*, Owerri: Lui House of Excellence Ventures.
- Nworgu, L. & Elian, B. (2015). Teachers practice of SBA techniques in sciences classes. *International Journal of Educational Research* 14(2), 242-251
- Obiefuna, C.A., Afuruobi, A.O., Anyanwu, S.U. & Izuagba, A.C. (2010). - *Issues in Curriculum Implementation*. Owerri: Joe Publishers Mamkpa.
- Obilor, E.I., Ozim, N.P., & Ezeala, S.I. (2018). Requirements for the implementation of SBA in public secondary schools in Rivers State. *International Journal of Innovative Education Research*, 6(3), 85-91, July-Sept.
- Okoroafor, S.A. (2009). *Tests, Measurement and Educational Statistics*. Lagos: OSA Enterprises.
- SBA Consultancy Team. (2005). *2007 HKCEE English Examination: Introduction to the SBA component*. Hong Kong: HKEAA.
- Yem, T. (2012). Teachers' Perception of SBA in Nigerian Secondary Schools. *Mediterranean Journal of Social Sciences*, 3 (1), January.