World Journal of Innovative Research (WJIR)
ISSN: 2454-8236, Volume-9, Issue-6, December 2020 Pages 01-07

Analysis of Psychometric Properties of English Language West African Senior School Certificate Examination in Borno State, Nigeria

Salihu Abdullahi GALLE, ALAKU Emmanuel Monica, Dr. SAMUEL John

***Abstract*— This study focused on the investigation of psychometric properties of English language West African Senior School Certificate Examination (WASSCE) in Borno State, Nigeria. Three research questions and two null hypotheses guided the study. The senior secondary students' scripts who sat for the examination in 2020 constituted the population of the study. Probability proportionate sampling technique was used, particularly the cluster sampling for selection of the sample for the study. The marked answer scripts of the students were used as instruments for data collection. Classical test theory of measurement was used as a model for determining the difficulty, discrimination and distracter indices of the items. Kuder-Richardson K-R20 formula was used for determining the reliability coefficient of the items. The findings show that some items have moderate difficulty, discriminated well between the upper and lower ability groups of examinees. The findings further reveal that the examination has low content validity but has reliability coefficient of 0.73, which was moderate. It was concluded that the items were not properly generated and arranged. It is therefore recommended that WASSCE as a large scale assessment responsible for the awarding senior school certificate should improve English language items standard of the examination by involving measurement and measurement connoisseur in the examination items development process to enhance its psychometric properties to a tolerant level.**

***Index Terms*— Psychometric properties, English language, WASSCE, Borno State.**

I. INTRODUCTION

The significance of English Language acquisition for proficiency in all Nigerian school subjects cannot be overemphasized because most of the subjects in Nigerian schools instructional materials written in English Language, except Nigerian languages and Arabic language [1]. The importance of this subject may have led the Nigeria Government to make it a compulsory subject at basic education and senior secondary school levels as well as prerequisite for admission into tertiary institutions [2]. In Nigeria, English Language is one of the core subjects taught at all levels. Students read, write and express themselves in any given task through English language. The large scale assessment such as West Africa Examination Council (WAEC) in quantifying learners/examinees cognitive performance according to their ability levels using standardized achievement instrument and these instrument composed of dichotomous items that measure reliability for a test with binary variables**,** that is A, B, C, D, E or answers that are right or wrong [3].

WAEC was established in the year 1952 to conduct examinations in the following West Africa Countries: Ghana, Sierra Leone, Liberia, Gambia and Nigeria. West Africa Examination Council in Nigeria are authorizes to award Senior School Certificate Examinations in various subjects, such as English Language, Mathematics, Economics among others that served a criterion-validity to qualify a candidate into tertiary institutions. English Language as subject taught in all the levels of academic, it is applied in the study of arts, languages, social sciences, vocational studies, natural and physical sciences, through research and departmental documentation as well as in our everyday life to subdue our environment and reform our lives through daily domestic activities, construction of infrastructure and a host of others. The Federal Government of Nigeria, in realization of the significant of English language embarked on vigorous English language curriculum reforms and the establishment of the National English Language Centre (NELC) to enable our educational system to work towards improving our Science and Technology, implementation of initiatives like the Millennium Development Goals (MDG), National Economic Empowerment and Developmental Strategies (NEEDS) as well as Vision 20-2021. The English language compulsory in our primary and secondary schools is for skill acquisition and mastery of content taught so as to apply the knowledge of English language in Science and technology, everyday life activities and for the growth and development of our nation [4].

According to WAEC Head of National Office, Lagos [5] candidates that sat the West African Senior School Certificate Examination (WASSCE) for School Candidates, 2020 in Nigeria was total of One Million Five Hundred and Forty-Nine Thousand Seven Hundred and Forty (1,549,740) candidates registered for the examination from Nineteen Thousand One Hundred and Twenty-Nine (19,129) recognized secondary schools in Nigeria. Of the number that registered for the examination, One Million Five Hundred and Thirty-Eight Thousand Four Hundred and Forty-Five (1,538,445) candidates sat the examination. The examination was also administered to candidates from some schools in Benin Republic, Cote d'Ivoire and Equatorial Guinea where the Nigeria curriculum for Senior Secondary

Salihu Abdullah GALLE, Department of Educational Foundations, Nasarawa State University Keffi, Nigeria
ALAKU Emmanuel Monica, Department of English Language Education, Nasarawa State University Keffi, Nigeria
Dr. SAMUEL John, Department of Educational Foundations, Nasarawa State University Keffi, Nigeria

School is being used. Remarkably, the examination was also conducted in Chibok Local Government Area of Borno State, the first time since the abduction of over 200 school girls in the area by insurgents, six years ago and over 65.24% of the total number of candidates that sat for the exam, obtained credits and above in a minimum of five subjects, including English Language and Mathematics. Out of this number, four hundred and ninety-seven thousand one hundred and thirty-nine (497,139) 49.53% were male candidates, while five hundred and six thousand five hundred and twenty-nine (506,529) 50.47% were female candidates. The percentage of candidates in this category in the WASSCE for School Candidates, 2019, that is, those who obtained credit and above in a minimum of five (5) subjects, including English Language and Mathematics, were 64.18%. Thus, there is a marginal 1.06% improvement in performance in this regard (WAEC Head of National Office, Lagos, 2020).

However, students' gender is an issue on large scale assessment performance, [6] stated that gender is a socially constructed term depicting the system of relations between males and females, and designates behaviours, attitudes, roles, status and other processes that govern the relationship among sexes in a given educational, socio-economic and political context. Gender is defined as the behavioural, cultural, or psychological traits typically associated with one sex [7]. Despite the efforts made by various tenures of the Borno State, there is still persistent poor performance in English language in the Senior Secondary Certificate Examinations (SSCE) conducted in Nigeria by West African Examinations Council (WAEC). The SSCE results revealed students inability to score highly in English language in Borno State. There has been mass failure rate in English Language in both male and female candidates. For instance, from the year 2016-2019, the pass rate at credit level in Borno State, Nigeria, 12.58, 15, 13.17% and 11.16%, while total percentage of candidates with ordinary pass and failure grades ranged from 84.6% to 89.73% [8].There has been reported mass failure of students in public examinations like the West African Senior School Certificate Examinations (WASSCE,2017) show that 1,567,016 candidates registered for the examination, out of which 1,559,162 candidates sat for the examination. The total number of candidates that sat for the exam, 829,853 were male and 729,309 were female, representing 53.22% and 46.27% respectively.1,471,151, (94.36%) have their results fully processed and released while95,734 candidates (5.64%) have a few of their subjects still being processed due to errors traceable to the candidates: 1, 490,356 candidates, representing 95.59% obtained credit and above in two (2) subjects, 1,436,024 candidates, representing 92.44% obtained credit and above in three (3) subjects, 1,357,193 candidates, representing 87.05% obtained credit and above in four (4) subjects, 1,243,772 candidates, representing 79.77% obtained credit and above in five (5) subjects, 1,084,214 candidates, representing 69.54% obtained credit and above in six (6) subjects and 923,486 candidates, rep. 59.22%, obtained minimum of credit in 5 subjects including English Language and Mathematics. The percentage age of candidates in this category in the WASSCE for School Candidates in 2017 was 38.68% & 52.97%, respectively. Two hundred and fourteen thousand, nine hundred and fifty two (214,952) candidates' results, represent 13.79% are being withheld in connection with various reported cases of exam malpractice, and these students (candidates) were ranged between the ages bracket of 16 to 21 years, and 22 to 27 years respectively. The alarming report shows that there are systematic or random errors that usually occur when writing WASSCE in Nigeria. The errors are in three categories: the first ''errors inherent in the instrument, ''errors in the use of the instrument and ''errors emanating from the responses of test takers' [9].

Consequently, to ascertain the degree of tribulations, the researchers assessed psychometric characteristics of examinations WAEC 2020 items to determine the quality of the items to rule out the possibility of nature of test items being a contributing factor to persistent high failure rate in the subject. Psychometric characteristics of examinations refer to certain attributes inherent in tests upon which an assessment of candidates is based. [10] defined Psychometrics as a field of study concerned with the theory and techniques of psychological measurement, which includes the measurement of knowledge, abilities, attitudes, personality traits and educational measurement. These characteristics include the difficulty index, the discriminating index, distractor index, validity and reliability indices of the test items. Items that are correctly answered by students do not convey any message about individual differences in performance. Item difficulty tries to estimate how easy or difficult is the item, the higher the value, the easier the item or lower the difficulty. The ability of an item to discriminate between higher ability examinees and lower ability examinees is known as item discrimination. There are several methods being used to assess item discrimination. These include, finding the difference in the proportion of high and low achieving students who score the item correctly.

Therefore, it is necessary to know the psychometric properties of examination items constructed by these examination bodies to ascertain its effectiveness. [11] stated that Item Analysis as probably the most important tool to increase test effectiveness. It is a scientific way of improving the quality of tests, and test items in an item bank. An item analysis provides three kinds of important information about the quality of test items. Item difficulty is a measure of whether an item was too easy or too difficult. Item discrimination is a measure of whether an item discriminated between candidates who knew the test well and candidates who did not. Distractor Index measures the effectiveness of alternatives, that is, to determine whether distractors (incorrect but plausible options) tend to be chosen by the less able examinees and not by the more able examinees.

This study anchored on classical test theory (CTT) of measurement, which assumes that each individual has a true score which would be obtained if there are no errors in measurement. At the item level, CTT does not invoke a complex theoretical model to relate an examinee's ability to success on a particular item. Instead, it considers a pool of examinees and empirically examines their success rate on an item, which is known as the p-value of the item or item difficulty (Fan, 1998). The central model of CTT is that, observed scores are composed of the true score and error

score, denoted as X = T + E. Where X = Observed score, T = True score and E = Error score. CTT considers a pool of examinees, irrespective of test items and is also sample dependent. It focuses on the examination of item facility (difficulty), discrimination and the effectiveness of distracters. These are the basis for using CTT in this study. The relevance of determining the psychometric properties in instrument development process has been stressed [12, 13, 14, & 15).Important psychometric properties are difficulty, discrimination and distracter indices observed in test items, based on the performance of candidates responding to the items. Difficulty index shows the proportion of students that got an item right in both the upper and lower ability groups of testees [16, 17 &18). Discrimination index shows how an item discriminates between the upper and the lower ability group of students, while distracter index shows how the incorrect options distract the lower ability groups from selecting the correct answer.

Several literatures were discussed related to psychometric properties of items examination conducted by by large scale assessment. For [19] findings of the study showed that the difficulty and guessing indices of the English language items constructed by the two examination bodies are comparable while the discriminating powers not comparable. It is, therefore, recommended that certificates issued by WAEC and NECO could be used for same purposes without any discrimination since the items constructed by the examination bodies are of comparable standard in terms of their qualities. [20] findings show that some items have moderate difficulty, discriminated well between the upper and lower ability groups of examinees. The findings further reveal that the examination has low content validity but has reliability coefficient of 0.74, which was moderate. It was concluded that the items were not properly generated and arranged. It is therefore recommended that Education Resource Centre, responsible for the conduct of the examination in the State, should improve the quality of the examination by engaging measurement experts in the test development process to enhance its psychometric properties.

Despite the significance attached to English language in the entire academic environment, performance of in senior school certificate examination in WAEC English language has become a matter of concern because of the possibility that students will no longer be self-employed and self-reliant when they leave school. Chance, performance of students in English language in recent times that prompted the researchers to undertake the analysis of psychometric properties of English language items to determine the nature of the items and their adequacy, consistency and reliable as used in WAEC 2020. In order to achieve this objective, research questions and hypotheses that focused on difficulty, discrimination and distracter indices of the examination conducted in 2020 by WAEC were answered.

Research questions

1. What is the range of difficulty indices of 2020 West Africa Examination Council English language?
2. What is the range of discrimination indices of 2020 West Africa Examination Council English language?
3. What is the range of distracter indices of 2020 West Africa Examination Council English language?

Hypotheses

Ho1: There is no significant difference between male and female students range of difficulty indices of 2020West Africa Examination Council English language

Ho2: There is no significant difference between male and female students range of Discrimination Indices of 2020West Africa Examination Council English language

II. MATERIAL AND METHODS DESIGN

The study employed a descriptive research design of survey type. The population consisted of all the 1,549,740 WAEC 2020 candidates who sat and wrote the English language examination from 19,129 recognized senior secondary schools in Nigeria. Samples of 1,000 students answer scripts were selected from ten public senior secondary schools in Borno State. The students answer scripts were dichotomized into male and female using multistage random sampling procedure. Nigerian is divided into six geo-political zones: are North-Central, North-West, North-East, South-South, South-East, and South-West Including Federal Capital Territory (FCT) Abuja. Before the selection, lottery method of simple random sampling technique was also employed to obtain a sample size of 1,000 answer scripts from one geo-political zone (North-East), one State (Borno) and twenty senior secondary from ten Local Government Area of Borno State, Nigeria. The answer scripts were randomly selected from WAEC marking Centre (custodian) Borno State, Nigeria. Having arranged the performance of the students in order of magnitude, 27% (355 scripts) of the upper ability group and 27% (355 scripts) of the lower ability group were sorted making the number of scripts used for item analysis to be 710 and the remaining one are moderate ability students.

Content validity of the English language WAEC 100 items was determined by the researchers, using the syllabus and the items on the question paper to determine the level of deviations of the items from the curriculum, and an operational chart. The researchers prepared the operational chart for the purposed of making comparison of WAEC English language items on the question paper. The difficulty indices of the items were determined by the researchers by finding the proportion of students in the item analysis group who scored each item right .Items with difficulty indices of less than 0.30 were considered difficult items, whereas items with difficulty indices of more than 0.80 were considered easy items. Hence, difficulty indices that lie within the range of 0.30 to 0.80 are considered to be of moderate and adequate difficulty.

The discrimination indices of the items were determined by finding the difference between number of high scoring students and low scoring students over half of number used for item analysis, who score an item correctly. Discrimination indices that have negative values from-1 through 0 to 0.19 indices were considered to be poor items, which need to either be removed or revised, indices of 0.2 – 0.29 were considered to be acceptable items, indices of 0.3 – 0.39 were considered good items, while

indices of 0.4 and above were considered excellent items as suggested in literature [21, 22, 23 & 24). The difficulty and discrimination indices of the essay items were determined by dichotomizing the scores with underlying normal distribution. The passed marks (5-10) were scored as 1, while the failed marks (0-4) were scored as 0. The effectiveness of distracters was determined. The distracter indices that were positive were considered not effective, meanwhile those indices that were negative were considered effective. The reliability of the items was established using Kuder-Richardson (K-R20). The reliability of the WAEC English language items was 0.76 which was considered to be moderate. The moderate reliability coefficient indicates that the items of the examination are internally consistent in measuring the topics that were assessed at a moderate level. The moderate reliability of internal consistency is expected in view of the low content validity of the examination. This is in agreement with [24] that the low content validity of the items usually tampers with the reliability of the items, making the items to be considered as poor items. Some of the probable factors for these are either that the items were not trial tested, or were generated without the involvement of test experts. Items could have also been generated without the consideration for their difficulty, discrimination and distracter indices. Since the items are composed dichotomously [25]. The data collected by the researchers were analysed using BILOG-MG software statistical analysis generate item difficulty levels, discriminating powers and distracter indices of the examination items and Paired Samples Test was used to test hypotheses at 0.05 level of significant and the results are presented in Tables below.

III. Results

RQ1: What is the range of Difficulty Indices of 2020 West Africa Examination Council English language?

Table 1: Range of Difficulty Indices of 2020 West Africa Examination Council English Language

Item Difficulty Range	Items No	Percent	Level of Difficulty
Less than 0.30	4	6.67 %	Difficulty
0.31 to 0.80	51	85.00 %	Moderate
0.81 to 1.00	5	8.33 %	Easy
Total	60	100%	

The range of items difficulty indices in Table 1 show that 4(6.67%) of the 100 WAEC English language items have difficulty level, 51(85%) have moderate difficulty level and 5(8.33%) have easy difficulty level respectively. This result is good because items of moderate difficulty tend to do better job of discriminating between students and work together to provide higher test reliability as noted in Item Difficulty. Nonetheless, the fact remains that the low content validity established for the examination is an issue that requires further investigation in order to improve its content validity during instrument development process. The range of difficulty levels of the items are displayed in pie-chart figure 1.

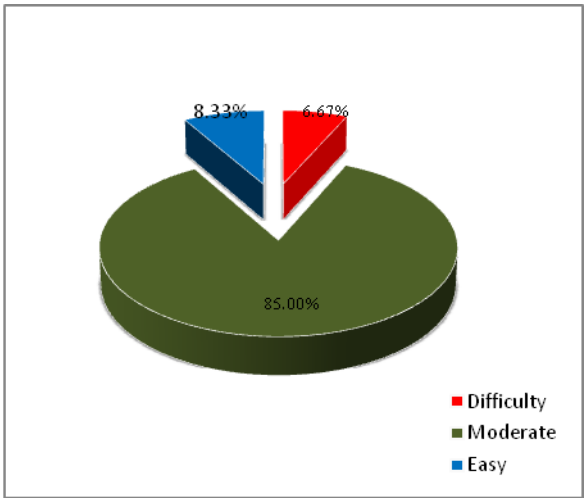

Fig 1*: Range of difficulty levels*

RQ2: What is the range of Discrimination Indices of 2020 West Africa Examination Council English language?

Table 2 Range of Discrimination Indices of 2020 West Africa Examination Council English Language

Item Discrimination Range	Items	Percent	Level of Discrimination
0.40 to 1.00	28	46.67	Excellent
0.30 to 0.39	11	18.33	Good
0.20 to 0.29	6	10.00	Acceptable
-1.00 to 0.19	15	25.00	Poor
Total	60	100	

The range of item discrimination indices in Table 2 reveals that 28(46.67%) of the 100 items have excellent discrimination, 11(18.33%) have good discrimination item, 6(10.00%) have acceptable items and 15(25.00%) have poor have item discrimination. This implies that there items that did not discriminate among the 60 items 2020 WAEC English language adequately. The items that could not discriminate adequately also have implication for future examination in the subject. This signified that, the items cannot give the true picture of the abilities of the examinees. Hence, chances of the examinees guessing in order to pass the examination were very high. The discrimination levels of the items are displayed in pie-chart figure 2.

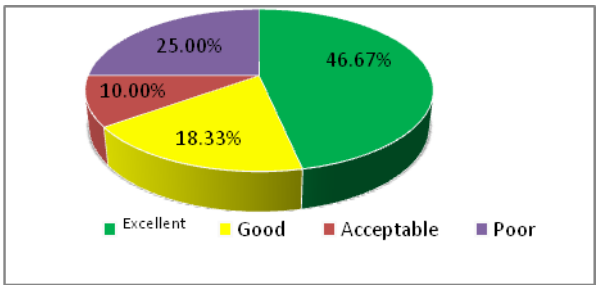

Fig 2: *Discrimination levels*

RQ3: What is the range of Distracter Indices of 2020 West Africa Examination Council English language?

Table 3 Effectiveness Distracter Indices of 2020 West Africa Examination Council English Language

Distracter effectiveness	Items	Percent
Effective (negative indices)	41	68.33
Ineffective (positive indices)	19	31.67
Total	60	100

Table 3 shows the results of the analysis of distracter effectiveness, 41(68.33%) of the 10o items multiple-choice 2020 WAEC English language have negative distracter indices and were considered to be effective, while 19(31.67%) of the items are positive and were considered ineffective. This implies that some of the options in the item distracted, the examinees in the high ability group that need to be reviewed for effectiveness in attracting the low ability students as expected in item analysis using classical test theoretical model. The distracter levels of the items are displayed in bar-chart figure 3.

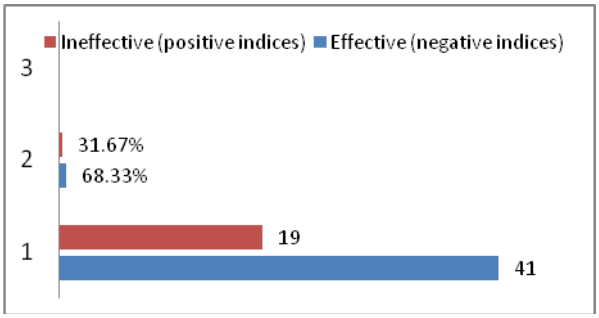

***Fig 3**; distracter levels of*

Hypotheses

Ho1: There is no significant difference between male and female students range of Difficulty Indices of 2020 West Africa Examination Council English language

Table 4: Paired Samples Test of Difference between Male and Female Students Range of Difficulty Indices

		Mean Diff	Std. Dev	SEM	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
					Lower	Upper			
Male-Students	**Female**	34.6800	5.1339	.7260	41.553	45.0864	5.1100	999	.0600
		0	6	5	6				

Table 4 reveals male and female students mean of 34.68 with standard deviation of 5.13. These data were subjected to paired sample t-test of significance difference. The result reveals that there is a significance difference [N = 1000, t = 5.11, df = 999, p = .000 (p>.05)] in the range of Difficulty Indices of 2020 West Africa Examination Council English language. The null hypotheses (**Ho_1**), was therefore retained hence there is no significant difference between male and female students range of Difficulty Indices of 2020 West Africa Examination Council English language.

Ho2: There is no significant difference between male and female students range of Discrimination Indices of 2020West Africa Examination Council English language

Table 5: Paired Samples Test of Difference between Male and Female Students Range of Discrimination Indices

		Mean Diff	Std. Dev	SEM	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Male-Students	**Female**	36.6500	5.5539	.7260	41.553	45.0864	5.1100	999	.0600
		0	6	5	6				

Table 5 reveals male and female students mean of 36.65 with standard deviation of 5.55. These data were subjected to paired sample t-test of significance difference. The result reveals that there is a significance difference [N = 1000, t = 5.11, df = 999, p = .000 (p>.05)] in the range of Discrimination Indices of 2020 West Africa Examination Council Mathematics. The null hypotheses (**Ho_2**), was therefore retained hence there is no significant difference between male and female students range of Discrimination Indices of 2020 West Africa Examination Council English language.

IV. Discussion

Table 1 shows the range of items difficulty indices level. Moderate difficulty tend to do better job of discriminating between students and work together to provide higher test reliability as noted in Item Difficulty. Nonetheless, the fact remains that the low content validity established for the examination is an issue that requires further investigation in order to improve its content validity during instrument development process. Drawing inferences on the bases of research question one, hypothesis one was tested and the result in Table 4 indicated that there is no significant difference between male and female students range of Difficulty Indices of 2020 West Africa Examination Council English language. This finding corroborated that of [26] findings of the study showed that the difficulty and guessing indices of the mathematics items constructed by the two examination bodies are comparable while the discriminating powers not comparable. It is, therefore, recommended that certificates issued by WAEC and NECO could be used for same purposes without any discrimination since the items constructed by the examination bodies are of comparable standard in terms of their qualities. Difficulty index shows the proportion of students that got an item right in both the upper and lower ability groups of examinees [27; 28; &29].

The range of item discrimination indices in Table 2 reveals that items that did not discriminate among the 100 items 2020

WAEC English language adequately. The items that could not discriminate adequately also have implication for future examination in the subject. This signified that, the items cannot give the true picture of the abilities of the examinees. Hence, chances of the examinees guessing in order to pass the examination were very high. Drawing inferences on the bases of research question one, hypothesis two was tested and the result in Table 5 indicated that there is no significant difference between male and female students range of Discrimination Indices of 2020 West Africa Examination Council English language. This finding is in agreement with that of [30] findings show that some items have moderate difficulty, discriminated well between the upper and lower ability groups of examinees. The findings further reveal that the examination has low content validity but has moderate reliability coefficient. Discrimination index shows how an item discriminates between the upper and the lower ability group of students, while distracter index shows how the incorrect options distract the lower ability groups from selecting the correct answer.

Even though, there were moderate difficulty and discrimination indices in some of the items of WAEC 2020 English language Examination, there are instances of items with moderate difficulty, but low discrimination; easy items with adequate discrimination; difficult items with negative discrimination. This problem could be explained by the views of [31] and [32] that negative discrimination index is most likely to occur when an item covers complex material written in such a way that it is possible to select the correct response without any real understanding of what is being assessed.

Lastly, Table 3 shows the results of the analysis of distracter effectiveness of the 6o items multiple-choice 2020 WAEC English language have negative distracter indices and were considered to be effective, while other items are positive and were considered ineffective. This implies that some of the options in the item distracted, the examinees in the high ability group that need to be reviewed for effectiveness in attracting the low ability students as expected in item analysis using classical test theoretical model. This is in agreement with [33] that the low content validity of the items usually tampers with the reliability of the items, making the items to be considered as poor items. Although, there were moderate difficulty and discrimination indices in some of the items of WAEC 2020 English language Examination, there are instances of items with moderate difficulty, but low discrimination; easy items with adequate discrimination; difficult items with negative discrimination. This problem could be explained by the views of [34] and Professional Testing [35] that negative discrimination index is most likely to occur when an item covers complex material written in such a way that it is possible to select the correct response without any real understanding of what is being assessed

V. Conclusion

This study focused on the investigation of psychometric properties of English language WASSCE in Borno State, Nigeria. The findings further reveal that the examination has low content validity and moderate reliability coefficient. It was concluded that the English language items were not properly generated and arranged based on the content of the subject. It is therefore, WASSCE as a large scale assessment responsible for the awarding senior school certificate should improve English language items standard of the examination by involving measurement and measurement connoisseur in the examination items development process to enhance its psychometric properties to a tolerant level.

References

[1] S. A. Galle, E. M. Alaku, & V. Paul. Effect of group discussion on senior secondary school students english language comprehension achievement and retention in Keffi, Nasarawa state. *Journal of Science, Technology and Education (JSTE)*; http://nsukjste.com/. 4(7), 2020,79-92.

[2] C.A Nelson, A. E. Nwankwo, & U.Tochi. Impact of Cooperative Learning on English Language Achievement among Senior Secondary Students in Delta State, Nigeria: Implication for Counseling. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS) 5 (7)*, 2014, *70-76.*

[3] K. A, Korb. Calculating reliability of quantitative measures. A seminar paper presented at University of Jos, 23rd August, 2015

[4] C. A. Ugodulunwa & U. P Okolo, Effects of formative assessment on mathematics Test Anxiety and Performance of Senior Secondary School Students in Jos, Nigeria. *Journal of Research & Method in Education (IOSR-JRME) e-ISSN: 2320–7388,p-ISSN: 2320–737X V(5)2, 2015, 38-47.*

[5] West Africa Examination Council (WAEC) Head of National Office, Lagos Report. 2020.

[6] S.A. Galle, C. S. Atiku, & A.U. Gado. Teachers and Students Perception on Measurement Error in Economics Achievement in Senior Secondary Schools in Nasarawa State, Nigeria. *Journal of Global issues in Education and Sustainable Development. 1(1), 2019, 90-109.*

[7] Merriam-Webster Online Dictionary (2013). Free Encyclopedia Britannica Retrieved 20/07/2014 from www.umaine.edu/jrre/20_5.htm. In S. A. Galle, E. M. Alaku, & V. Paul. Effect of group discussion on senior secondary school students english language comprehension achievement and retention in Keffi, Nasarawa state. *Journal of Science, Technology and Education (JSTE)*; http://nsukjste.com/. 4(7), 2020,79-92.

[8] Borno State Ministry of Education. Annual Examination Report, 2019.

[9] C. M. Anikweze. Measurement and Evaluation for Teacher Education, (2nd Ed.) Enugu, SNAAP Press, 23-24, 2015.

[10] K. Salters-Pedneault. Psychometric properties.Retrieved February 3, 2012.Available online athttp://bpd.about.com/od/glossary/g/psychometric-properties.htm. 03/2/2012.

[11] U.W.Oshkosh. Item Analysis, Testing Services Support; http://www.uwosh.edu/testing/facultyinfo/itemanalysis.php, 2002. In T.D. Moyinoluwa. Analysing the Psychometric Properties of Mathematics in Public Examinations in Nigeria. *Journal of Research on Humanities and Social Sciences www.iiste.org ISSN (Paper)2224-5766 ISSN (Online)2225-0484 (Online) 5(7), 2015*

[12] S.F. Popoola, Application of item analysis for cognitive measures. In G.O. Akpa and E.A. Abama (Eds.), Readings in continuing education.(1St Ed.). Jos: Emmaba press.

[13] C.A. Ugodulunwa. Fundamentals of educational measurement and evaluation. Jos: Fab AniehNig. Ltd, 2008.

[14] K. Salters-Pednault. Psychometric properties.Retrieved February 3, 2012.Available online athttp://bpd.about.com/od/glossary/g/psychometric-properties.htm. 03/2/2012.

[15] S. A.Galle, V. Paul, & G. A. Andzutsi. Effect of Changes in Item-Sequence on Students Academic Achievement In Multiple-Choice Test Of Mathematical-Economics In Colleges Of Education, Lagos State Nigeria. *World Journal of Innovative Research (WJIR) ISSN: 2454-8236, 9(4), 2020, 69-76*

[16] C.A. Ugodulunwa, & C.L. Ugwuanyi. Understanding educational evaluation.(2ndEd.). Jos: Fab Anieh Nig. Ltd, 1999.

[17] S.F. Popoola. Application of item analysis for cognitive measures.InG.O. Akpa andE.A. Abama (Eds.), Readings in continuing education.(1St Ed.). Jos: Emmaba press.2004.

[18] C.A. Ugodulunwa. Fundamentals of educational measurement and evaluation. Jos: Fab AniehNig. Ltd, 2008.
[19] O.J. Aborisade & O. O. Fajobi. Comparative analysis of psychometric properties of mathematics items constructed by WAEC and NECO in Nigeria using item response theory approach. *Journal of Educational Research and Review. DOI: 10.5897/ERR2019.3850 15(1), 1-7, 2020.*
[20] C. A. Ugodulunwa & L. Bark. Analysis of Psychometric Properties of Business Studies Junior Secondary Certificate Examination in Plateau State, Nigeria. *Online International Interdisciplinary Research Journal, {Bi-Monthly}, ISSN 2249-9598, Volume-V, Issue-II, Mar-Apr 2015 Issue*
[21] C. A. Ugodulunwa & C.L. Ugwuanyi.Understanding educational evaluation.(2ndEd.). Jos: Fab Anieh Nig. Ltd. 1999.
[22] S. Matlock-Hetzel. Basic concepts in item and test analysis. A paper presented at the annual meeting of the southwest Educational Research Association, Austin. Retrieve November 21, 2011.Available online at http://ericae.net/ft/tamu.Espy.htm. 1997.
[23] N.K. Mitra, H.S. Nagaraja, G. Ponnudurai, & J.P. Judson. The levels of difficulty and discrimination indices in type A multiple-choice questions of pre- clinical semester 1 multidisciplinary summative test. Retrieved January 18, 2012.Available online atwww.Imu.edu.my/ejournal/approved/IMEC2.originalp02- 07pdf. ,2009.
[24] S. Varma. Preliminary item statistics using point-biserial correlation and p-values; Educational data systems, inc.Retrieved November 10, 2011.Available online atwww.eddata.com/resources/publications/edspoint-biserialpdf. 2011.
[25] K. A, Korb. Calculating reliability of quantitative measures. A seminar paper presented at University of Jos, 23rd August, 2015.
[26] O.J. Aborisade & O. O. Fajobi. Comparative analysis of psychometric properties of mathematics items constructed by Waec and Neco in Nigeria using item response theory approach. *Journal of Educational Research and Review. DOI: 10.5897/ERR2019.3850 15(1), 1-7, 2020.*
[27] S.F. Popoola. Application of item analysis for cognitive measures.InG.O. Akpa andE.A. Abama (Eds.), Readings in continuing education.(1St Ed.). Jos: Emmaba press.2004.
[28] C.A. Ugodulunwa. Fundamentals of educational measurement and evaluation. Jos: Fab AniehNig. Ltd, 2008.
[29] [29]. C. A. Ugodulunwa & C.L. Ugwuanyi.Understanding educational evaluation.(2ndEd.). Jos: Fab Anieh Nig. Ltd. 1999
[30] C. A. Ugodulunwa & L. Bark. Analysis of Psychometric Properties of Business Studies Junior Secondary Certificate Examination in Plateau State, Nigeria. *Online International Interdisciplinary Research Journal, {Bi-Monthly}, ISSN 2249-9598, Volume-V, Issue-II, Mar-Apr 2015 Issue*
[31] S. Matlock-Hetzel. Basic concepts in item and test analysis. A paper presented at the annual meeting of the southwest Educational Research Association, Austin. Retrieve November 21, 2011.Available online at http://ericae.net/ft/tamu.Espy.htm. 1997
[32] Professional testing (2010).Building high quality exam program.Retrieved November 21, 2011.Available online atwww.proftesting.com/testtopics/steps9php.
[33] S. Varma. Preliminary item statistics using point-biserial correlation and p-values; Educational data systems, inc.Retrieved November 10, 2011.Available online atwww.eddata.com/resources/publications/edspoint-biserialpdf. 2011.
[34] S. Matlock-Hetzel. Basic concepts in item and test analysis. A paper presented at the annual meeting of the southwest Educational Research Association, Austin. Retrieve November 21, 2011.Available online at http://ericae.net/ft/tamu.Espy.htm. 1997
[35] Professional testing (2010).Building high quality exam program.Retrieved November 21, 2011.Available online atwww.proftesting.com/testtopics/steps9php.

Salihu Abdullah GALLE, Department of Educational Foundations, Nasarawa State University Keffi, Nigeria

ALAKU Emmanuel Monica, Department of English Language Education, Nasarawa State University Keffi, Nigeria

SAMUEL John, Department of Educational Foundations, Nasarawa State University Keffi, Nigeria