COMPARATIVE ANALYSIS OF THE DEAF AND DUMB STUDENTS' ACADEMIC PERFORMANCE IN MATHEMATICS AND ENGLISH LANGUAGE IN BENUE STATE, NIGERIA

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Abstract

The study compared Deaf and Dumb students' academic performance in Mathematics and English Language in Benue State, Nigeria. The main objective of the study was to examine if there would be any difference between the academic performance of Deaf and Dumb students in Mathematics and English Language. Three research questions and corresponding three hypotheses guided the study. The study adopted Ex-post facto design. Thirteen (13) Deaf and Dumb junior secondary school students in Benue State for 2022/2023 academic session formed the population of the study. Using purposive sampling technique, 13 JSS2 and JSS3 Deaf and Dumb students from St. Francis school for the Deaf and Blind students in Vandeikya, Benue State were selected. Data were collected using Mathematics Academic Performance Test (MAPT) and English Language Academic Performance Test (ELAPT). Mean and standard deviation were used to answer the research questions while t-test was used to test the hypotheses at 0.05 level of significance. The findings revealed that there is a significant difference between the mean scores of Deaf and Dumb students' academic performance in Mathematics and English Language in Benue State in favour of Mathematics (P= 0.001<0.05). The result of the findings further revealed that there is no significant difference between the mean scores of male and female Deaf and Dumb students' academic performance in Mathematics (P = 0.935>0.05). In the same vein, it was found that there is no significant difference between the mean scores of male and female Deaf and Dumb students' academic performance in English Language in Benue State (P = 0.197>0.05). Based on the findings, it was recommended that English Language teachers for Deaf and Dumb students should work harder to improve their performance in the subject. Also, there should be continuous training and retraining for the professional teachers who are teaching mathematics and English Language in special education schools to enhance their performances in the two subjects.

Key words: Comparative Analysis, Academic Performance, Deaf and Dumb students, Mathematics and English Language.

Introduction

One basic objective of the Universal Basic Education (UBE) programme in Nigeria is to ensure the acquisition of the appropriate levels of literacy, numeracy, communicative and life skills needed for the laying of a solid foundation of life-long learning (Federal Government of Nigeria, 2014). This objective informs the compulsory teaching of Mathematics and English Language in Primary and Secondary schools in Nigeria.

Mathematics is one of the compulsory subjects in Nigeria Education system from Primary to Secondary schools and even getting admission

into tertiary institution in Nigeria. Lotore (2016) notes that Mathematics is a science of quality, structure, space and change. Mathematics seeks out patterns, formulates new conjectures and establishes truth by rigorous deduction from appropriately chosen axioms and process. Students with special needs such as deaf and dumb may find it difficult to learn numbers and shapes effectively. This is because the deaf and dumb need visual transmission of information, use of sign language and lip reading to identify and comprehend numbers and shapes in Mathematics. This may influence students' academic performance in a way.

Mathematics is a very critical subject that plays vital role for the development of humanity both within and outside school environment. This is because almost every aspect of human life has some elements of Mathematics (Aligba & Ominyi 2020). This shows that performing well in Mathematics by students with special needs such as the deaf and dumb would help them connect to the world in different ways. In spite of the importance of Mathematics, students' academic performance in Mathematics is poor (West African Examination Council 2019, 2022 Chief Examiner's Report).

The general poor performance of students in Mathematics may not be different from the deaf and dumb students' academic performance in Mathematics. This is because learning Mathematics requires attention and ability to listen to the process of solving mathematical problems and asking questions where necessary for in-depth understanding. By nature, the deaf and dumb students are at a disadvantage of listening and asking questions

in Mathematics lessons through expressions. This implies that students' physical factors can be blamed for poor performance of special need students in Mathematics.

The significance of academic performance in learning including Mathematics is eminent. Wang and Degot (2018) affirms that academic performance is an observable and measurable behaviour of a student or students in a particular test, examination or assessment. Achor (2020) also asserts that academic performance is that which is measured by the final grade earned in a subject, course or task. This shows that how well students have learned is determined by their academic performance. Researchers therefore became interested in finding out how well students learn Mathematics based on their academic performance. This may have informed comparative analytical studies of students' academic performance in two or more subjects such as Mathematics and English Language. The importance of academic performance in Mathematics especially for students with special needs cannot be overemphasized in the teaching and learning process of such learners.

Over the years, students' poor performance in Mathematics has been the worry of researchers and science experts. Analytical studies have been carried out to determine the percentage of students' failure in Mathematics annually across different levels of learners, classes and educational system. Scholars (Achor, 2020; Ayebale, 2020) have attributed students' poor performance in Mathematics and related subject like physics to their abstract nature. Others believe that students' poor performance in Mathematics is caused by teachers' methodology, teachers' and students' attitude

towards Mathematics (Charles, Yeh & Cheng, 2019).

Students with special needs such as hearing impairment, deafness and dumbness, blindness or multiple disabilities which may make them feel bad for not being able to learn Mathematics among other subjects in a normal classroom with other normal students. This may negatively influence their academic performance in Mathematics among other subjects studied in school. Special needs education is a programme designed to meet the unique needs of persons with special needs such as hearing impairment, the blind, deaf and dumb learners that the general education programme cannot cater for. The Federal Government of Nigeria (FGN, 2014) identifies the categories of individuals with special needs persons to include visual impairment, hearing impairment, physical and health impairment, intellectual disability, emotional and behavioural disorders, speech and language impairment, learning disabilities, multiple disabilities, albinos and the gifted or talented. Inclusive system of education helps to bridge the educational gaps for all Nigerians such that deaf and dumb persons can acquire basic literacy (English) and numeracy (Mathematics) skills. In view of this assertion, Imam and Okech (2021) posit that the goal of inclusive education is for everyone, everywhere to be able to build their literacy and numeracy skills.

Meeting this goal of inclusion and equalization of educational opportunities for all citizens including special needs students to build their literacy and numeracy skills may not have been fully met by the government of Nigeria at the federal, state and local government levels with multiples of children with disabilities not catered for. Incorporating them into the world of literacy and numeracy may be more of theory than practice. English is a literacy based development subject that makes learning worthwhile in Nigeria classroom dominated by multiple ethnic groups and learners such as those with special needs. Nordquist (2019) notes that English language is a world language that recognizes standard within the academic circle. Meeting this standard by the deaf and dumb students may be difficult because of their disabilities even with special aids such as Visual Aids like charts or transparencies, and sign language. This could have negative influence on the deaf or dumb or both students' academic performance in English language.

English language is one of the compulsory subjects which students with special needs must learn functionally in order to have access to the world of literacy and numeracy. In Nigeria, English is a lingua franca and the language of education because of the multi-ethnic groups in the country (FRN, 2014). Teaching English language in primary and secondary levels of education to children with special needs may help provide adequate education for all persons with special needs in order for them to contribute their own quota to the development of the nation. This may give them sense of belonging and encourage them to learn English Language better.

Students' academic performance in English language may help to determine how well students with special needs have acquired the skills of the language such as listening, speaking, reading and writing. According to the

Chief Examiner's Report on students' performance in English Language in the West African Examination Council (WAEC, 2019) examination for Basic Education Certificate Examination, students performed poorly in English Language. This report is a manifestation of junior secondary school three students' performance in English Language for special needs learners across gender.

Gender is a moderator variable in this study. Gender is a socio-cultural phenomenon that distinguishes male students from female students. Ezeh (2013) asserts that gender ascribes roles, responsibilities and duties to male and female individuals in the society. The gender factor and distinction between male and female learners has posed lots of problem to scholars who have not being able to have a consensus report on students' academic performance. Ezeh (2013) affirms that the controversies of gender difference on the students' academic performance in education have continued to be inconclusive. While some studies (Yushau & Omar, 2015; Muhammad; Abdullahi & Umar, 2020) found that male students are better than female students in Mathematics. However, in English Language, others believed that female students outperformed male students in language skills (Adeyemi & Adeyemi, 2020; Hajovsky, Schwaitz & Kaufronam, 2015). On the other hand, studies carried out by Chianson, Aligba, and Jimin, (2015) found that both male and female students perform equally in Mathematics just like those of Udu and Asue, (2018) and Agbinya, Muodumogu and Ukume, (2020) found that both male and female students perform equally in English Language if given equal opportunities to learn. Dzer (2019) affirms that there existed a significant difference in the performance of students in English Language and Mathematics in BECE in favour of English Language. Dzer also found out that there was no significant difference in the performance of male and female students in Mathematics. The contradiction based on gender and students' academic performance necessitated this study to compare male and female Deaf and Dumb students' academic performance in Mathematics and English Language in Benue State.

Research Questions

The study was guided by the following research questions

1. What is the difference between the mean academic performance scores of Deaf and Dumb (DD) students in Mathematics and English language in Benue State?
2. What is the difference between the mean academic performance scores of male and female Deaf and Dumb (DD) students in Mathematics?
3. What is the difference between the mean academic performance scores of male and female Deaf and Dumb (DD) students in English language?

Hypotheses

The study was guided by three hypotheses and tested at 0.05 level of significance:

1. There is no significant difference between the mean academic performance scores of the Deaf and Dumb (DD) students in Mathematics and English language in Benue State.
2. There is no significant difference between the mean academic performance scores of male and female Deaf and Dumb (DD) students in Mathematics in Benue State.

3. There is no significant difference between the mean academic performance scores of male and female Deaf and Dumb (DD) students in English language in Benue State.

Research Method

The study adopted Ex-post facto design such that researchers developed Mathematics Academic Performance Test (MAPT) and English Language Academic Performance Test (ELAPT). Each of the two instruments namely MAPT and ELAPT were developed to consist of 20 multiple choice objective items. The objective items is made of four multiple choice (A,B,C,&D) using format of BECE (the public examination taken by junior secondary school students at the end of upper basic 3 Class). Each of the 20 items carries 5 marks giving a total of 100%. The instrument MAPT was given to two experts in Mathematics Education and one in Measurement and Evaluation while ELAPT was given to two experts in English Education and one in Measurement and Evaluation from Benue State University, Makurdi for validation. After validation, the instruments were trial tested to calculate the

reliability of the instruments using Kuder-Richardson -20 (K-R-20). The reliability coefficient of the instruments were 0.87 for MAPT and 0.91 for ELAPT. The two instruments were administered on 13 JSS2 and JSS3 Deaf and Dumb students in St. Francis School for the Deaf/Blind in Vandeikya, Benue State using purposive sampling technique for data collection. Data collected were analysed using mean and standard deviation to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance to ascertain whether or not there exist a significant difference between the two groups in the three hypotheses.

Results

The data collected were analysed and presented in tables based on the three research questions and three null hypotheses.

Research Question One

What is the difference between the mean academic performance scores of Deaf and Dumb students in English and Mathematics in Benue State?

Table 1: Mean and Standard Deviation for the Academic Performance Scores of Deaf and Dumb Students in English Language and Mathematics

Type of Special Needs	Subject	No. of Students	Mean Score (%)	SD
Deaf and Dumb	English Lang.	13	40.00	12.91
	Mathematics	13	57.69	10.12
Mean Difference			17.69	

Table 1 shows the mean academic performance scores between the Deaf and Dumb students in

English and Mathematics. The table further shows that the Deaf and Dumb students have the

mean score of 40.00 and a standard deviation of 12.91 in English Language and the mean score of 57.69 and standard deviation of 10.12 in Mathematics. The mean difference of 17.69 is in favour of the Deaf and Dumb students in Mathematics. The standard deviation of Deaf and Dumb students in Mathematics (10.12) is less than that of English (12.91). This shows that

the performance in English Language is more heterogeneous than in Mathematics.

Research Question Two
What is the difference between the mean academic performance scores of male and female Deaf and Dumb students in Mathematics?

Table 2: Mean and Standard Deviation for Academic Performance Scores of Male and Female Deaf and Dumb Students in Mathematics

Subject	Gender	No. of Students	Mean Score (%)	SD
Mathematics	Male	5	58.00	7.58
	Female	8	57.50	11.95
Mean Difference			0.50	

Table 2 shows the mean and standard deviation for the difference between the academic performance scores of male and female Deaf and Dumb Students in Mathematics. The table further shows that the Deaf and Dumb male students have a mean score of 58.00 and a standard deviation of 7.58, while the female Deaf and Dumb students have a mean score of 57.50 and standard deviation of 11.95. The mean difference of 0.50 is in favour of Deaf and Dumb male students. The standard deviation of Deaf and Dumb male students in

Mathematics (7.58) is less than the Deaf and Dumb female students (11.95). This implies that the performance of Deaf and Dumb male students is homogeneous than the performance of the Deaf and Dumb female students.

Research Question Three
What is the difference between the mean academic performance scores of male and female Deaf and Dumb students in English Language?

Table 3: Mean and Standard Deviation for Academic Performance Score of Male and Female Deaf and Dumb Students in English Language

Subject	Gender	No. of Students	Mean Score (%)	SD
English Lang.	Male	5	48.00	8.94
	Female	8	36.25	14.09
Mean Difference			11.75	

Table 3 shows the mean and standard deviation for the academic performance scores of male and female Deaf and Dumb students in English Language. The table further shows that the Deaf and Dumb male students have a mean score of 48.00 and a standard deviation of 8.94, while the Deaf and Dumb female students have a mean score of 36.25 and a standard deviation of 14.07. The mean difference of 11.75 is in favour of the Deaf and Dumb male students in English Language. The standard deviation of Deaf and Dumb male students English (8.94) is

less than the performance of the Deaf and Dumb female students (14.09). This shows that the performance of Deaf and Dumb female students is heterogeneous than the performance of Deaf and Dumb male students.

Hypothesis One
There is no significant difference between the mean academic performance scores of Deaf and Dumb Students in Mathematics and English Language in Benue State

Table 4: Independent t-test Analysis for Significant Difference between the Mean Academic Performance Scores of Deaf and Dumb Students in Mathematics and English Language

Type of Special Needs	Subject	No. of Std	Mean	T	df	Sig
Deaf and Dumb	English Language	13	40.00			
				−3.888	24	0.001
	Mathematics	13	57.69			

Table 4 shows the independent t-test analysis for the difference between the mean academic performance scores of Deaf and Dumb Students in Mathematics and English Language. The table further shows that t = − 3.888, df = 24 and p = 0.001. Since the p-value is less than the alpha level (p = 0.001 < 0.05), the null hypothesis is rejected. This implies that there is a significant difference between the

mean academic performance scores of Deaf and Dumb students in Mathematics and English Language in favour of Mathematics.

Hypothesis Two
There is no significant difference between the mean academic performance scores of male and female Deaf and Dumb students in Mathematics in Benue State

Table 5: Independent t-test Analysis for Significant Difference between the Mean Academic Performance Scores of Male and Female Deaf and Dumb Students in Mathematics

Gender	Subject	No. of Std	Mean	t	df	Sig
Mathematics	Male	5	58.00			
				0.083	11	0.935
	Female	8	57.50			

Table 5 shows that t = .083, df = 11 and p = 0.935. Since the p-value is greater than the alpha level (p = 0.935 > 0.05), the null hypothesis is not rejected. This means that there is no significant difference between the mean scores of male and female Deaf and Dumb students' academic performance in Mathematics.

Hypothesis Three
There is no significant difference between the mean academic performance scores of male and female Deaf and Dumb students in English Language in Benue State

Table 6: Independent t-test Analysis for Significant Difference between the Mean Academic Performance Scores of Male and Female Deaf and Dumb Students in English Language

Subject	Gender	No. of Std	Mean	t	df	Sig
English Lang	Male	5	48.00	1.373	11	0.197
	Female	8	36.25			

Table 6 shows that t = 1.373, df = 11 and p = 0.197. Since the p-value is greater than the alpha level (p = 0.197 > 0.05), the null hypothesis is not rejected. This means that there is no significant difference between the mean academic performance scores of male and female Deaf and Dumb students in English Language.

Discussion of Findings
The discussion of findings of this study was based on the results of three research questions and three hypotheses that guided the study. The first finding of the study shows that there is a significant difference between the mean academic performance scores of Deaf and Dumb students in Mathematics and English Language in favour of Mathematics in Benue State. This finding disagree with Dzer (2019) who found that there is a significant difference in the performance of students in English Language and Mathematics in BECE in favour

of English Language. This is because students with Deaf and Dumb disabilities face similar difficulties in learning English Language and Mathematics but find it easy learning Mathematics than English Language due to different learning styles, methods, materials and approaches that gives the Deaf and Dumb students an edge in Mathematics over English.

The second finding of the study shows that there is no significant difference between the mean academic performance scores of male and female Deaf and Dumb students in Mathematics in Benue State. This finding agrees with Chianson, Aligba, and Jimin (2015) who found that male and female students have equal learning ability in Mathematics. This is because even though the physical deformity of both male and female Deaf and Dumb students taught Mathematics using sign language and the methods peculiar to them could not change their performance in

the subject just like students without special needs.

The third finding of the study shows that there is no significant difference between the mean academic performance scores of male and female Deaf and Dumb students in English Language in Benue State. This report aligns with the finding of Dzer (2019), Udu and Asue (2018) who found that there is no significant difference between male and female students' performance in English Language. This implies that academic ability of male and female Deaf and Dumb students in English is the same just like those of students without special needs.

Conclusion

Based on the findings, it was concluded that disparity exists between the academic performance scores of Deaf and Dumb students in Mathematics and English Language in favour of Mathematics. However, gender is not a significant influencer of the Deaf and Dumb students' academic performance in Mathematics and English Language.

Recommendations

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

1. Ministry of Education at the state level should constantly monitor inclusive education of students with special needs particularly the Deaf and Dumb students in the teaching and learning processes of literacy and numeracy skills in education.
2. Specially trained teachers should be employed and supervised in the enhancement of inclusive education in Benue State by the government of the state through its relevant agencies.
3. Curriculum planners and designers should constantly review the curriculum contents of Mathematics and English Language to ensure that the interest of students with special needs is protected.

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