

# NIU Journal of Educational Research



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## Editorial

This issue of *NIU Journal of Educational Research* touches on Social Networking, Teaching Technology Integration, Think-Pair-Share Instructional Strategy and Educational Psychology.

One of the papers, in this issue, reveals that students' academic performance in Social Studies was significantly impacted by their use of social networking sites like Facebook and WhatsApp. It is, therefore, suggested that in order to increase academic performance, students should be encouraged to utilize Facebook and WhatsApp for academic purposes.

Another paper also highlights the need for gender-neutral education to cultivate critical thinking, empathy, and a more comprehensive range of career options. Strategies include challenging stereotypes, providing diverse role models, and creating inclusive learning environments. The article also addresses common misconceptions and concerns, highlighting global progress and successful initiatives. Social studies teachers are crucial in shaping inclusive curricula and promoting active engagement in advocating for gender-neutral education.

On the whole, this issue of *NIU Journal of Educational Research* features many empirical and theoretical based articles which can be of great benefit to every reader.

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## Social Networking and its influence on Academic Performance of Upper Basic Social Studies Students in Delta State, Nigeria

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**Abstract.** This study examined the influence of social networking regarding the academic performance of upper basic Social Studies students in Delta State. The study adopted an ex-post facto research design. Two research questions and two hypotheses guided the study. The sample size of the study comprised 1023 basic 9 students randomly drawn from 11 schools. The stratified random sampling technique was used to select students for the study. The instruments for data collection were questionnaire and Social Studies students' academic performance scores. Cronbach's alpha analysis was used for estimating the internal consistency reliability of the questionnaire. The questionnaire items were analyzed and tested for significant level of  $P < 0.05$ . Pearson coefficient of determination was used to answer the research questions, while Pearson Product Moment Correlation was used to test the null hypotheses at 0.05 significant level. According to the study's findings, students' academic performance in Social Studies was significantly impacted by their use of social networking sites like Facebook and WhatsApp. Based on the results, it was suggested that in order to increase academic performance, students should be encouraged to utilize Facebook and WhatsApp for academic purposes.

**Keywords:** Social Studies, Social Networking, Facebook, WhatsApp, Academic Performance.

### 1. Introduction

In Nigeria, a number of factors affect how well students perform academically on both internal and external exams. The result of a student's work at an educational institution is their academic Performance, which is typically stated as a grade (Wikipedia, 2019). Through Social Studies instruction, students acquire

constructive attitudes of unity, camaraderie, and collaboration toward nation-building. Preparing students to be more responsible, logical, responsive, and compassionate citizens is the main objective of Social Studies education. It has been observed that, despite the value of Social Studies as a means of educating students to become more self-reliant and compassionate people, most of them spend a lot of time chatting on social media platforms like Facebook and WhatsApp, which may have an impact on their academic performance (Johan, 2019).

The rapid evolution of technology has resulted in the use of technology as the best medium for exploring the vast area of knowledge. Technology has assisted both students and teachers in becoming more informed, enlightened, and up-to-date with the ever-changing and dynamic world. Social networking, for example, is becoming more prevalent in education (Abikwi & Okafor, 2022). Social networking is a set of internet websites, services, and practices that facilitate interaction, participation, and sharing. Social networking is a fantastic information source and communication technology that is gaining popularity globally as a means of communication. This platform allows users to use several social networking sites, including Facebook and WhatsApp, to express their thoughts, opinions, and perspectives with one another in a worldwide community (Khalid, 2017).

### 1.1 Statement of the Problem

Social networking seems to be an issue of concern, as students tend to lose their focus from learning and engage in social networking. It has been observed that students pay a great deal of attention to social networking, spending time chatting and making friends on social media platforms. It is not uncommon

to see a student chatting while learning in the classroom. Social networking has recently taken a prominent place in the minds of students. Students spend a lot of time chatting on Facebook and WhatsApp. Students' use of social networking sites is thought to have an effect on their academic achievement. Thus, the study's main question is: How do Delta State upper basic social studies students' academic performance and social networking compare?

### 1.2 Purpose of the Study

The primary goal of the research is to ascertain how social networking and academic achievement relate to upper basic social studies students at Delta State. In particular, the research aims to:

- determine the connection between the usage of Facebook and academic performance of upper basic Social Studies students in Delta State.
- find the relationship between the usage of WhatsApp and academic performance of upper basic Social Studies students in Delta State.

### 1.3 Research Questions

To guide the study, the following research questions were raised:

- What is the relationship between the usage of Facebook and academic performance of upper basic Social Studies students in Delta State?
- What is the relationship between the usage of WhatsApp and academic performance of upper basic Social Studies students in Delta State?

### 1.4 Hypotheses

The following hypotheses were formulated to guide the study at 0.05 significant level:

Ho1: There is no significant relationship between the usage of Facebook and academic performance of upper basic Social Studies students in Delta State.

Ho2: There is no significant relationship between the usage of WhatsApp and academic performance of upper basic Social Studies students in Delta State.

## 2. Social Networking and Academic Performance of Students

The use of social networking sites has increased significantly among youths, particularly upper basic students. The widespread use of social networking among students is aided by mobile phone internet access. Social networking can be seen as the use of a website designed to build and reflect relationships between people and organizations who share connections, interests, and activities (Adegbite-Badmus & Joda, 2019). Examples of social networking sites utilized in this study are Facebook and WhatsApp. One of the most popular social networking sites, especially with students, is Facebook. Users may establish individualized profiles on Facebook with basic information like school and employment history, leave messages on friends' pages, upload and tag images and videos, and more. Facebook is an invaluable tool for students to utilize in their studies since it allows them to communicate with other users on different levels and exchange ideas and opinions (Hashi et al., 2018). Owusu-Acheaw and Larson (2015) looked at how social networking use affected college students' academic achievement. The descriptive study shown that students used Facebook and WhatsApp at rates of 66.4% and 20%, respectively, and that they used their phones for social networking for between 30 and 3 hours on average each day. While just 9.4% of students were involved in academic pursuits, 90.6% of students utilized social media for downloading and talking. Time spent on academic activities was positively and significantly correlated with academic success, according to the correlation study. The study also discovered a detrimental effect of social networking time on students' scholastic performance.

Researchers Iro-Idoro and Jimoh (2017) found that Facebook users often performed badly in school-related tasks. Facebook and WhatsApp are the most used social networking sites among students, according to Othman et al. (2017). The survey found that 20% of students used social networking sites for longer than four hours, while 46% of students used them for one to three hours. Analysis of inference was used. Additionally, the study found no connection between academic achievement and social media use. The study's findings demonstrated that students' academic performance may suffer if they use social media improperly. That is, if they don't utilize it for exchanging and discussing academic material. Kolan and Dzandza (2018) found that students' academic performance suffered when they used Facebook. Studies show that students utilized Facebook for purposes other than academics.

Among the most well-known smartphone applications for facilitating communication is WhatsApp (Hutchinson, 2020). According to Yeboah and Nyagorme (2022), using WhatsApp in the classroom can enhance inquiry-based learning strategies that foster critical thinking, creativity, teamwork, and critical reflection. Teachers have highlighted WhatsApp's educational benefits and encouraged students to utilize the messaging app to learn about the variety of engaging tasks that can be completed in the field (Woztell.com, 2022).

Rahman and Mithum (2021) looked into how social media use affected Bangladesh Agricultural University students' academic performance. With graphical depictions, the study was descriptive. The results of the survey showed that 6% of students and 94% of students used social networking for academic objectives. The majority of students are engaged on Facebook and WhatsApp, per the survey. Merely 9.4% participated in educational endeavors. Time spent on academic activities was positively and significantly correlated with academic success, according to the correlation study. Additionally, the study discovered that students' academic performance suffers when they spend too much time on social media.

The influence of social networking on the academic performance and interpersonal connections of health science students in Sri Lanka was examined by Chandrasena and Ilankoon (2022). The study was descriptive in nature, and the analysis showed that 79.5% of the students had social media accounts. The most popular social media platform was WhatsApp, which was used 96% of the time, followed by Facebook (70%). The main purposes of these accounts were for online learning (65.7%), entertainment (83.4%), and communication (85.1%). Seventy-two percent of students reported using social networking sites for two to six hours per day. Additionally, a statistically significant correlation between students' academic achievement and their frequency of social networking use was found in the data.

In the Edo South Senatorial District of Edo State, Abikwi and Okafor (2022) carried out descriptive research on the effect of social media on secondary school students' academic performance. The results of the study showed that social networking is often utilized by secondary school students and that this use affects their academic achievement. According to Kamal et al. (2022), 73% of students used social networking sites other than for academic purposes, with Facebook being the most popular platform. The majority of students use social networking both at home and at school, and most of them use it for more

than four hours a day, according to the survey. Additionally, the study found that students' academic performance suffered as a result of the amount of time they spent on social networking.

In Lagos, Nigeria, Adeniyi (2022) looked at the detrimental effects of social networking on secondary school students' academic performance. According to the research, students utilized social media platforms including Facebook, Instagram, WhatsApp, YouTube, and Twitter in a way that prevented them from getting any value out of them. The poll also revealed that most students no longer have a reading culture since they spend more time socializing than reading. Aku and Omale (2020) examined the impact of social networking on the academic performance of Kaduna Polytechnic office technology and management students. The findings indicated that social networking may occasionally have a positive impact on students' academic performance as opposed to just a negative one.

Alam and Aktar (2021) examined how social media usage affected students' academic achievement at Bangladesh's Islamic University. The grade point average (GPA), attendance in class, and self-perception were the factors that determined academic success. Data was gathered from a sample of one hundred management science faculty students using a questionnaire. According to the study, academic success was negatively impacted by social media, including Facebook. Data for the study was gathered from 77 respondents across two faculties utilizing a correlation research approach. According to this study, there was just a little negative correlation between Facebook use and kids' academic achievement. Additionally, the report recommended that students monitor their Facebook accounts for matters pertaining to their studies.

Igboke and Olom (2021) studied the effect of social media on students' academic achievement in Calabar's Entrepreneurship Education program. There were 120 students from the University of Calabar in the study: 60 men and 60 girls. The study's research design was a descriptive survey. Data were gathered using a questionnaire, and its mean and standard deviation were utilized for analysis. The descriptive analysis's conclusions show that students use social networking sites for a variety of reasons, such as keeping in touch with old and new acquaintances, searching for new ones, downloading music and movies, sharing information, conversing, and looking for educational resources. Additionally, the study found that social networking sites improved students' academic performance.

At the University of Sindh in Pakistan, Aftab and Ghulam (2022) looked at how students' usage of social media affected their academic performance. The sample size consisted of 130 randomly selected students from a population of 500 students on the Sindh University Campus in Larkana. Data were gathered for the study using a questionnaire and a descriptive research methodology. ANOVA and regression analysis were employed to assess the data. The majority of students, according to the research, utilized social media platforms like Facebook and WhatsApp to further their careers, increase their knowledge, and get the most up-to-date information. Furthermore, social networking did not substantially impair students' academic performance, according to the study.

Numerous academics have examined social networking and students' academic performance based on the material that is currently accessible. Nevertheless, the examined research revealed conflicting information about how Facebook and WhatsApp usage has an impact on students' academic performance; as a result, the literature is ambiguous. Furthermore, the majority of the research examined the factors outside of Delta State and in different subject areas. Thus, more research is required to determine the connection between social networking and Upper Basic Social Studies students' academic performance in Delta State.

### 3. Methodology

A research design that was ex-post facto was used in this study. Ex-post facto study focuses on how past occurrences might be used to infer future causes. Therefore, once something has happened, it cannot be changed by a researcher. All forty-three thousand and twenty-two (43,022) Basic 9 (JSS III) students from Delta State's four hundred and sixty-eight (468) public Upper Basic schools, which provide the data collecting subject, made up the study's population. The

### 4. Results

**Research Question 1:** What is the relationship between Facebook usage and academic performance of Upper Basic Social Studies students in Delta State?

**Table 1:** Mean Scores and Standard Deviation Analysis on Facebook usage and academic performance.

Variables	N	Mean	SD	r	r <sup>2</sup>	r <sup>2</sup> %	Remark
Facebook usage	975	2.64	.79	.409	0.167	16.7%	Positive relationship
Academic performance		3.32	.78				

Source: SPSS Output, 2024

Table 1 presents the academic performance and Facebook usage mean scores and standard deviation analysis of Delta State Upper Basic Social Studies students. The findings indicate a favourable correlation between Facebook use and

rationale behind selecting Basic 9 students was the belief that Basic 7 and Basic 8 students lacked sufficient maturity. After completing three academic sessions of Social Studies instruction, Basic 9 students were judged qualified to share their experiences in answering questions about the connection between academic success and social networking among Upper Basic Social Studies students in Delta State. In all, 1,023 Basic 9 students were selected at random from 11 Upper Basic schools located in the three Senatorial districts of Delta State.

The study's tools included a questionnaire with the title social networking and academic performance of Upper Basic Social Studies students in Delta State and Social Studies students' academic performance scores. To gather data, a four-point Likert scale was employed. The reliability of the questionnaire's internal consistency was estimated using Cronbach's alpha analysis. After the instrument's items were examined and assessed for significance at the level of  $P < 0.5$ , the reliability values for Facebook and WhatsApp were found to be  $r = 0.6$  and  $0.7$ ,  $P < 0.5$  respectively, suggesting the usefulness and reliability of the instrument. With the help of four research assistants, the researcher distributed copies of the questionnaire to the respondents. To ensure a high return rate, the researcher and assistants tried to wait and get copies of the completed questionnaires from the respondents as soon as possible. 975 out of the 1023 questionnaire copies that were distributed were recovered at the conclusion of the activities, suggesting a 95% retrieval rate. The data analysis was conducted using the 975 copies of the questionnaire that were obtained. The Pearson Coefficient of Determination was used to answer the study questions, while the Pearson Product Moment Correlation Coefficient was used to evaluate the null hypotheses at the 0.05 level of significance. The Pearson statistical technique was used in this study because it helps determine the direction and strength of a relationship between variables.

academic achievement. There is a correlation between Facebook usage and academic performance of Upper Basic Social Studies students in Delta State, as evidenced by mean scores of 2.64 and 3.32 above the benchmark mean value and standard deviation scores of .79 and .78 that were not far apart.

**Research Question 2:** What is the relationship between WhatsApp usage and academic performance of Upper Basic Social Studies students in Delta State?

**Table 2:** Mean Scores and Standard Deviation Analysis on WhatsApp usage and academic performance.

Variables	N	Mean	SD	r	r <sup>2</sup>	r <sup>2</sup> %	Remark
WhatsApp usage	975	2.68	1.20	.723	0.523	52.3%	Positive relationship
Academic performance		2.59	1.24				

Source: SPSS Output, 2024

Table 2 displays the academic performance and mean scores, along with a standard deviation analysis, of Delta State Upper Basic Social Studies students' use of WhatsApp. The findings indicate a favourable correlation between WhatsApp use and academic performance. This is demonstrated by the standard deviation scores of 1.20 and 1.24 and the mean scores of 2.68 and 2.59 above the benchmark mean value, which indicate a positive correlation between WhatsApp usage and academic performance of Delta State Upper Basic Social Studies students.

**Test of Hypotheses**

**Ho1:** There is no significant relationship between Facebook usage and academic performance of Upper Basic Social Studies students in Delta State.

**Table 3:** Correlation result for the significant relationship between Facebook usage and academic performance of Upper Basic Social Studies students in Delta State.

		Facebook usage	Academic performance
Facebook usage	Pearson Correlation	1	.409**
	Sig. (2-tailed)		.000
	N	975	975
Academic performance	Pearson Correlation	.409**	1
	Sig. (2-tailed)	.000	
	N	975	975

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

According to Table 3, there is a positive link between Facebook usage and academic performance, as indicated by the Pearson's r correlation value of .409. Furthermore, at the 0.05 level of significance, the P-value of .000 indicates the existence of a statistically significant link. Consequently, the null hypothesis is disproved. This suggests that Facebook usage and academic performance among Delta State Upper Basic Social Studies students are significantly correlated.

**Ho2:** There is no significant relationship between WhatsApp usage and academic performance of Upper Basic Social Studies students in Delta State.

**Table 4:** Correlation result for the significant relationship between WhatsApp usage and academic performance of Upper Basic Social Studies students in Delta State.

		WhatsApp usage	Academic performance
WhatsApp usage	Pearson Correlation	1	.723**
	Sig. (2-tailed)		.000
	N	975	975
Academic performance	Pearson Correlation	.723**	1
	Sig. (2-tailed)	.000	
	N	975	975

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

According to Table 4, there is a positive link between academic performance and WhatsApp usage, as indicated by the Pearson's  $r$  value of .723. This indicates that using WhatsApp can help students do better academically. Additionally, a statistically significant correlation between WhatsApp usage and academic performance is indicated by the P-value of .000. Consequently, the null hypothesis is disproved. This demonstrates that there is a substantial correlation between Delta State Upper Basic Social Studies students' academic performance and their usage of WhatsApp.

## 5. Discussion of Findings

### **Relationship between Facebook usage and academic performance of Upper Basic Social Studies students in Delta State.**

The study's initial conclusion demonstrates a favourable correlation between Facebook use and Upper Basic Social Studies students at Delta State's academic achievement. This suggests that students' academic performance is influenced by their use of Facebook. This could be the outcome of Facebook giving students a forum to discuss academic matters with teachers and other students, as well as to share thoughts and opinions. Facebook usage's benefits vary depending on why it was utilized. According to the research, students' academic performance improves when they use Facebook for educational purposes, such as keeping track of assignments and schoolwork with their peers and teacher. In contrast to the results of this investigation, Facebook use was found to have a detrimental impact on students' academic performance by Owusu-Acheaw and Larson (2015); Iro-Idoro and Jimoh (2017); Othman et al. (2017); Kolan and Dzandza (2018); and Alam and Aktar (2021). Studies show that students utilized Facebook for purposes other than academics.

### **Relationship between WhatsApp usage and academic performance of Upper Basic Social Studies students in Delta State.**

The study's second conclusion indicates that students at Delta State who are enrolled in Upper Basic Social Studies have a favourable correlation between their usage of WhatsApp and their academic performance. This is explained by the fact that WhatsApp is a mobile application designed to make communication easier. Using WhatsApp can facilitate inquiry-based learning strategies that foster creativity, critical thinking, teamwork, and critical reflection. This result is consistent with the findings of Yadav (2018),

Hutchinson (2020), Chandrasena and Ilankoon (2022), Pirzado and Shaika (2022), Yeboah and Nyagorme (2022), and Woztell.com (2022) who discovered that the use of WhatsApp led to improved academic achievement in students.

## 6. Conclusion

Based on the findings of the study, it was concluded that:

there was a significant relationship between the usage of Facebook and academic performance of upper basic Social Studies students in Delta State, and there was a significant relationship between the usage of WhatsApp and academic performance of upper basic Social Studies students in Delta State.

## 7. Recommendations

As a result of the study's findings, the following recommendations were made:

- Students should use social networking sites such as Facebook and WhatsApp for mostly academic purpose.
- Facebook and WhatsApp should be used in moderation by the students.
- The school authorities should create awareness to the upper basic students on how to use social networking sites to improve academic performance.

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## Investigating Factors Affecting Academic Achievement And Response Pattern Of Secondary School Students With Physical Disabilities In Niger State, Nigeria

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**Abstract.** Although disability is part of human condition and often perceived by people as inability to perform certain tasks, it is, however, not a license to be lazy, but ability to live and be actively involved in academic pursuits by those affected. The purpose of this study was to assess factors affecting academic achievement and aberrant response pattern of secondary school students with physical disabilities. A quasi-experimental design was used. The study adopted 66 teaching staff randomly selected from the 66 public secondary schools from where 121 (59 males and 62 females) students with various and varying degrees of physical disabilities were purposively selected in Niger State of Nigeria. A self-developed questionnaire titled, “Teachers Opinion on Factors Affecting Academic Achievement and Response Pattern of Students with Physical Disability (TOFAA-ARPS-PD) was used to collect data. Data collected were analyzed using descriptive statistics of mean and standard deviation. The findings revealed that, while orthopaedic impairment was the most prevalent disability among students with varying degrees of physical disabilities in Niger State public schools, IRT related teacher-based factors and school-based factors recorded a high overall influence on their academic achievement and response pattern with means of 2.79 and 3.28 respectively. This, however, does not negate the influence of student-related factors (with mean of 2.48) on the academic achievement and response pattern of disabled students. A holistic approach to supporting students with disabilities by addressing student-based factors, teacher-based factors and school-based factors was recommended.

**Keywords:** Physical disability, Aberrant response pattern, Item response theory, School-based factors, Teacher based factors and Orthopaedic impairment

### 1. Introduction

Testing and assessments are integral parts in the process of educational measurement initiated by scoring of the item responses of the examinees. This process is systematically practised in order to determine and predict students’ potentials from their abilities in responding to examination questions. Some students, according to Smith and Lamprianau (2016), are more successful at attaining academic achievement than others can be due to several factors, some of which are out of the control of the students. Academic achievements are not just a crucial aspect of students’ educational journey, but also serve as a measure of progress, open doors to higher education, boost self-confidence, and provide opportunities for personal and professional growth (Maingi-Lore, 2016). This is not unrelated to the quality of education received by the students, which are fundamental human rights for all citizens. According to Oladele, Ogunwale and Dafwat (2016), “fundamental human rights suggest for all students, irrespective of their abilities or disabilities have a right to be educated in the same classroom setting where possible.

Hence, Physical disabilities refer to a wide variety of conditions that may interfere with a child’s ability to perform everyday activities (Kambuta, 2021). According to Osman, 2021, “Such conditions include problems with muscles, problems involving the central nervous system, problems with the structure of the skeleton or health problems”. Physical disability limits a person’s physical capacity to move, coordinate actions, or perform physical activities. However, persons with Albinism, though usually may be as healthy as the rest of the population, can be classified as disabled because of the associated visual impairments (Burger, 2016).

Academic achievement of students at the level of secondary education has strong impact on other levels of higher and tertiary education as it determines whether a student will have the opportunity to continue his or her higher education which opens opportunities for career development, meaningful occupation and a chance for a dignified life for persons with disability (Maingi-Lore, 2016). The test/examination items administered to students are expected to evaluate how effectively they have mastered specific skills on what has been taught. Hence, the need to demonstrate a reliability and validity check. It is on this note that, Mahmud (2017), proffered that, Item Response Theory (IRT) is an important methodology which has been globally used in many assessment programs to analyze students' responses to test items with a goal of improving measurement accuracy and reliability.

Item Response Theory (IRT), also known as the Latent trait, as opined by Ojerinde, Popoola, Ojo and Onyeneho (2019), "is a mathematical theory about examinee (student) item and test performance and how performance relates to the abilities that are measured by the items in the test". In IRT the focus is, therefore, on the pattern of responses, where the item responses are considered the outcome variables, and the student's ability and item characteristics are the predictor variables (Bentler, 2021).

Aberrant response patterns occurs when there is a mismatch between observed and expected response patterns of students derived from a given measurement model (Drasgow and Levine, 2019). This explains the possibility of an examinee obtaining correct answers for wrong reasons when responding to dichotomous scored test items. Rob (2023) opined that; "an aberrant score pattern is one that is not likely to be true for various possible reasons leading to these unusual patterns". Smith and Lamprianou (2016) have suggested these various possible reasons to include cheating, distractions, guessing, copying, extreme creativity, test anxiety, special knowledge among others. According to Rob (2023), aberrant response patterns may lead to an overestimate or underestimate of students' ability regardless of the kind of test.

However, Kambuta (2021) found out that physically challenged students could perform excellently well in academics like the normal students. In view of this fact, the academic achievement of students with physical disabilities has therefore, been a source of concern to the researcher. Hence, there is need to assess these factors which could predict the pattern of responses to test questions, and consequently, the academic achievement of students with physical

disabilities in public secondary schools. This appears to have received little or no attention in Niger State of Nigeria.

### 1.1 Statement of the Problem

One of the most challenging tasks in classroom assessment is developing a valid, reliable and usable measuring instrument that can accurately depict students' knowledge level, skill level and/or ability. It becomes more difficult, especially, where students with physical disabilities and obvious challenges are involved and are expected to be measured and evaluated without overestimating or underestimating their ability regardless of the kind of educational test.

With an understanding that students with physical disabilities may be disadvantaged on their participation in class or academic activities, it is essential that the factors affecting their academic achievement in relation to the aberrant pattern of item responses they exhibit be appraised. Hence, the focus on the question; 'How does IRT-related-factors affects academic achievement and response pattern of secondary school students with physical disabilities, thereby jeopardizing measurement accuracy among them and invalidating the use of IRT?

### 1.2 Objective of the Study

- To investigate incidences of categories of physical disabilities among secondary school students in Niger State.
- To assess factors affecting academic achievement and response pattern of secondary school students with physical disabilities in Niger State.

### 1.3 Research Questions

- What is the difference in the incidences of categories of physical disabilities among secondary school students in Niger State?
- What is the difference in the factors affecting academic achievement and response pattern of secondary school students with physical disabilities in Niger State?

### 1.4 Theoretical Framework

This study employed Social Cognitive Theory (SCT) developed by Albert Bandura in 1986. The theory is based on the concept that learning is affected by cognitive, behavioral, and environmental factors. The process of observational learning is governed by four key aspects, namely; Attentional Processes,

Retentional Processes, Reproduction Processes and Motivational Processes (Vinney, 2019). The Social Cognitive Theory is a valuable evaluation tool in understanding the reciprocal interactions that shape an individual's sense of competence, taking into account the mutual effects of the individual, the physical and psychological environment and the task to be learned. By implication, this theory emphasizes on self-efficacy as critical element in human behaviour and motivation, and is particularly relevant to students with physical disability who by their very nature of the physical differences, often view themselves as lesser than their counterparts, and generally suffer from low self-esteem which greatly affects their academic achievement. Based on SCT, this study will consider academic achievement and response pattern (behavior) of secondary school (environment) students with physical disability (individual self-efficacy) and factors affecting them.

## 2. Conceptual Issues

### 2.1 Types of Physical Disability

The term Physical Disability is broad and covers a range of disabilities and health issues (Lekuta, 2019). People with physical disabilities are also referred to as physically disabled people, or handicapped (Talafha, 2022). Physical disability is defined by Lekuta, as "those whose physical limitations or health problems interferes with school attendance or learning to such an extent that special services, training, equipment, materials, or facilities are required". This category of disability includes people with different types of physical and observable disorder, including upper or lower limb(s) disability, absence of a body part, polio, visual and auditory disorders, or disability in co-ordination with different organs of the body (Kamal and Hussain, 2019).

For ease of identification and purpose of placement, five dimensions of physical disability are recognized namely; Orthopedic Impairment, Visual Impairment and Albinism, Hearing/Speech Impairment.

#### Orthopedic Impairment

This type of physical disability is a condition that is related to physical deformity or disability of the skeletal system and associated with motor function such as affected muscular and skeletal system, and affected central nervous system (Telda et'al). They find it difficult or impossible to use legs, arms, or body trunk effectively due to paralysis, stiffness, pain, or other impairments (Lekuta, 2019).

#### Visual Impairment and Albinism

Visual disability deals with difficulty in perception on what the child perceives and what the brain interprets. Khanal (2015) identified two types of visual impairment as Blind and Low Vision, stressing that, "a person who cannot see the fingers of a hand by both eyes at a distance of 10 feet, or cannot read the first line of Snellen chart, is blind. And for persons with low vision, Khanal further stated "is any person who cannot distinguish fingers of a hand from a 20 feet distance nor read the letters of the fourth line of Snellen chart.

Albinism is associated with a significant reduction or absence of pigmentation in the hair, skin, and eye at birth due to lack of melanin – a pigment responsible for brown, dark, and some yellow coloration (Satasha, 2021). It is often associated with visual problems resulting from involuntary eye movement, squinting and astigmatism which are from birth and lifelong, but not progressive (Nwosu, Unachukwu, Nwasor, and Ezennaka, 2019). Burger (2016) opined that, since persons with albinism are usually as healthy as the rest of the population with growth and development occurring as normal, but for their associated visual impairments, can be classified as disabled.

#### Hearing / Speech Impairment

These include children who are either completely deaf or partially deaf. Children with partial hearing disorder can often use hearing aids to assist their hearing (Kohzuki, 2018). ". Children affected by this type of disability uses sign language as a means of communication. In linguistic terms, sign languages are as rich and complex as any oral language, despite the common misconception that they are not 'real languages' (Lekuta, 2019).

Speech Impairment is a communication and language disorder, such as stuttering, disorder in sound production and fluency in voice or language. School children identified with this type of disorder have difficulty in expressing ideas and comprehending complex sentences and figurative language such as idioms and metaphors (Kohzuki, 2018). Students with speech and language impairment are faced with specific challenges within the education system which in consequence adversely affect a child educational achievement (Colclasure, Thoron and LaRose 2018).

### 2.2 Academic Achievement of Students with Physical Disabilities

Students' academic achievement connotes the extent to which a learner has achieved the educational goals"

(Alenezi, 2018). It is the ability of the student to study and remember facts and being able to communicate his knowledge orally or in written form even under testing/examination conditions (Veresova & Mala, 2016). It defines individual progress and improvement in terms of acquired knowledge, skills and competences. Hence, academic achievement of physically disabled students is needed to give a view about the condition of their education and an evaluation tool for education (Teesa, Karimah and Tarigan, 2017). For example, Children with orthopedic impaired challenges involving the movement skills, or visually impaired with complete or partial visual problem struggle to catch up. But when they are not able to meet up, and neither consideration from their teachers, nor help from fellow students who are non-physically challenged, lack of interest for learning and discouragement may set in, which can also affect academic achievement (Teubert, 2019). However, Teubert (2019) opined that some physically disabled students with normal intelligence provide a better academic achievement result than students with multiple disabilities’.

### **2.3 Aberrant Response Bias in Item Response Theory (IRT)**

Every response from each and every student to an item on instrument (test/examination) gives some idea about the individual’s level of ability (Clark, 2020). These responses to the items are measured by assignment of scores and grades within the context of educational objective of assessing both individual ability and item characteristic through the lenses of IRT model (Bentler, 2021). The assigned scores are used by teachers and evaluators to identify students’ strength and weaknesses, and to provide information in order to make sound decisions for educational improvements (Mahmud, 2017). However, one of the threats to the validity and accuracy of the estimated measure for performance is the Aberrant Responses of the student/test-taker.

Aberrant responses occur when the observed response patterns are not in harmony with the expected ones, which may jeopardize measurement accuracy among respondents and invalidate the use of IRT (Jia, Zhang and Zhu, 2019). For example, in a test, a student with very low cognitive ability may answer a more difficult item correctly and answering many simple items incorrectly.

### **2.4 Factors Affecting Academic Achievement and Response Pattern of Students**

Academic achievement is commonly measured through test/continuous assessments and

examinations, but there are no conclusive results over which individual factors successfully predict academic achievement (Bethel-Eke and Eremie, 2018). In any educational setting, inaccurate test scores could result in erroneous test result and consequently, the student academic achievement (Trabin, 2018). One of the most significant factors consistently identified across the literature is students’ cognitive ability to cope with the academic demands in secondary school setting (Al Husaini and Shukor, 2023). But when factors other than the student’s ability being measured affect the response process, the student’s response behaviour becomes abnormal, and the resulting test score does not adequately reflect the level of the latent (ability) trait (Avcu, 2021).

The most research works found in the literature by many authors (such as Crisan et’al 2017; Trabin, 2018; Gafni and Levine, 2021; Rob, 2023; Williams and Emons, 2019; and Clark, 2020) revealed some identified possible factors associated with aberrant responses as:

#### **Test Anxiety**

This is an emotional and complex reaction caused by an individual who interprets a test situation as a threat. Test anxious students do experience fear and heightened psychological activity in situations such as examinations and influence the manner in which they interpret and respond to test items”. Hence, it is a possible source of aberrance since its effect normally makes simple items seem very difficult to respondents which may result to many errors, usually in the first items of the test.

#### **Academic Self-Concept**

This relates to students’ perception of their academic competence and expectations of academic success or failure. Physically disabled persons feel they are often treated as socially inferior and academically not fitting may end up with a “cannot-do attitude”, low esteem, especially when they constantly realize that their body does not work like everyone’s else.

#### **Interest in Subject**

Student interest in subject is the inclination of a student towards a particular subject in which he or she is easily able to connect without any pressure. Students’ interest for each subject is correlated with academic outcomes.

Attention Deficit Hyperactivity Disorder (ADHD)

ADHD is a specific developmental disorder that comprises deficits in behavioral inhibition, sustained attention and resistance to distraction, and regulation of one’s activity level to the demands of a situation. This condition can certainly affect the response pattern, hence, disrupting academic performance, since children affected often have problems sitting still, staying focused, following instructions, staying organized, and completing assignments/test.

**Length of Test**

Length of test is the number of both the items and the score points per term in a given test.

**Item Arrangement**

In test construction, it is a practice to arrange items in order of their difficulty. This procedure gives confidence to individuals approaching the test and reduces wasted time on items that are beyond an individual’s ability.

**Mis-match between Curriculum and Test Content**

If item difficulty levels coincide with the content area that has not been treated and the examinee has less knowledge of that particular content area on the test, aberrant response patterns will result.

**Different Teacher**

There is a direct relationship between student test scores and stable, experienced, and qualified teaching staff. Frequent change of subject teacher can have a detrimental effect on the students’ academic achievement, and may cause disruptions in the existing work plan.

**Class Effect**

In academic environment, the condition of the class ranging from the size, arrangement and teacher to students’ ratio is of paramount importance in students’ academic success.

**Different School**

The school is a social and learning agent that provides the environment upon which students are formally educated in order to attain educational goals. Changing schools even within a district can disrupt the flow of learning in school which could affect the academic achievement of a student.

Since Academic achievement of students according to Bethel-Eke and Eremie (2018) is dependent on the responses of students and a function of the extent to which student<sup>1</sup>, teacher<sup>2</sup> or institution<sup>3</sup> has achieved their short term or long-term educational goals within a specified period; it becomes imperative to classify the aforementioned factors into the following three (3) groups.

**Table 1:** Classification of IRT – Related Factors

S/No	Student Based Factors	Teacher Based Factors	School Based Factors
1.	Test anxiety	Length of test	Class effect
2.	Academic self-concept	Items arrangement	School environment
3.	Interest in subjects	Mis-match between curriculum and test content	
4.	Display of ADHD	Different teacher	

**3. Research Methodology**

A quasi experimental design was used among 66 teachers randomly selected from the 66 public secondary schools from where 121 (59 males and 62 females) students with various and varying degrees of physical disabilities were purposively discovered and selected in Niger State of Nigeria. A self-developed questionnaire which yielded 0.76 validity index and 0.83 coefficients of internal consistency for teachers titled, “Teachers Opinion on Factors Affecting Academic Achievement and Response Pattern of Students with Physical Disability (TOFAA-ARPS-PD) was used to harvest data. The data was analyzed using descriptive statistics of percentages and mean. The 66 questionnaires that were distributed among the selected teachers were all returned for analysis.

**4. Results**

**Answering Research Questions**

The results of this study are presented in tables 2 and 3.

**Table 2:** Incidence of students with disability in Secondary Schools in Niger State

Disabilities	Male		Female	
	Freq	Percent	Freq	Percent
Orthopaedic Impairment (OI)	44	59%	31	41%
Visual Impairment and Albinism (VIA)	8	35%	15	65%
Hearing and Speech Impairment (HSI)	7	30%	16	70%
Total	59	49%	62	51%

Table 2 presents an overview of the incidence of students with physical disabilities in secondary schools across Niger State. Firstly, the result indicates that the most prevalent physical disability dimension among the students is Orthopaedic Impairment (OI), with 44 male students, constituting 59%, and 31 female students, representing 41%. This suggests a higher proportion of male students with orthopaedic impairment. Visual Impairment and Albinism (VIA) exhibits a different gender distribution, with 8 male students (35%) and 15 female students (65%). This reveals a higher percentage of female students with visual impairments and albinism in the State. Lastly, the data on Hearing and Speech Impairment (HSI) highlights 7 male students (30%) and 16 female students (70%), implying there is higher proportion of female students with Hearing and Speech Impairment.

**Table 3.** Descriptive Statistics of Teachers’ Responses on Factors Affecting Academic Achievement and Response Pattern of Students with Physical Disability in Niger State

Student Based Factors	AA%	A%	D%	CD%	Mean	Remark
Test anxiety	44	14	29	14	2.88	High
Academic self-concept	62	29	5	5	3.48	High
Interest in compulsory subjects.	18	21	42	18	2.39	High
Display of ADHD	0	3	11	86	1.17	Low
Sub-total	31	17	22	31	2.48	Fair
Teacher Based Factors						
Length of test	44	47	6	3	3.32	High
Items arrangement	53	41	6	0	3.47	High
Mismatch between curriculum and test content.	32	18	27	23	2.59	High
Different teacher	5	15	33	47	1.77	Low
Sub-total	33	30	18	18	2.79	High
School Based Factors						
Class effect	73	14	8	6	3.53	High
School environment	33	47	9	11	3.03	High
Sub-total	53	30	8	8	3.28	High

**Note:** 0.00-1.00=Very low; 1.01-2.00=Low; 2.01-2.49=Fair; 2.50-3.49=High; 3.50-4.00=Very High

Table 3 analyzes the factors affecting academic achievement and response pattern of students with physical disability in secondary schools in Niger State. The data indicates that Student Based Factors (STBF) had a moderate effect on the academic achievement and response pattern of the students, with an aggregate mean of 2.48. Test anxiety (2.88), academic self-concept (3.48), and interest in subjects (2.39) were identified as significant contributors to this effect.

These findings suggest that while student-related factors play a role in shaping academic achievement, their overall impact is moderate compared to other factors.

In contrast, Teacher Based Factors (TBF) had a high effect on academic achievement and response pattern, with an aggregate mean of 2.79. Factors such as the length of the test (3.32), items arrangement (3.47), and

mismatch between curriculum and test content (2.59) demonstrated a significant influence on student academic achievement. However, the presence of a different teacher (1.77) had a lower impact. Similarly, School Based Factors (SHBF) had a high effect with an aggregate mean of 3.28; Class effect (3.53) and school environment (3.03) identified as influential factors affecting student academic achievement and response pattern, in Niger State.

## 5. Discussion on the Findings

Findings from the study on research question one revealed that there is difference in the incidences of physical disability among secondary school students in the Niger State. The data showed that orthopaedic impairment was the most prevalent disability. This is in line with the findings of Wuraola, Abiola, Ayoola, Folasade, Abolore, Akeem, Ganiyu and Chandan (2023) whose study revealed that students with disabilities are not evenly distributed.

Physical disability is a complex and multidimensional concept that encompasses a wide range of physical impairments, each with its unique challenges and implications for education. In the context of inclusive and equitable learning environment and education, therefore, it is imperative to understand the distribution patterns and dimensions of students' disability within specific geographic regions, to ensure their needs are adequately addressed and appropriate support systems are in place.

The study further revealed that teacher-based factors and school-based factors have a high overall influence on the academic achievement of disabled students in Niger State, with sub-total means of 2.79 and 3.28 respectively. This result is not unconnected with the views of Maingi-Lore (2016) and Gomwalk and Nuhu (2022), whose findings revealed school-based factors have influence on academic achievement of students with physical disability.

These findings suggest that while student-related factors play a role in shaping academic performance, their overall impact is moderate compared to other factors. The findings highlight the need to address teacher-based and school-based factors to effectively support the academic achievement of disabled students in the state. Interventions and strategies targeting factors such as test length, item arrangement, curriculum alignment, class effect, and school environment could potentially lead to significant improvements in the educational outcomes of this vulnerable student population.

## 6. Conclusion

This study offers a comprehensive understanding of the factors affecting academic achievement and response patterns of secondary school students with physical disabilities in Niger State of Nigeria. By examining a wide range of factors, this research provides valuable information into the complex interplay of variables that shape the educational experiences and outcomes of disabled students. One of the striking findings is the significant variation in the incidences of different disability types across the state, with orthopaedic impairment being the most common. While critical factors affecting academic achievement and response patterns, including student-based factors, teacher-based factors, and school-based factors were identified.

## 7. Recommendations

- Investment in accessible educational resources, such as Braille materials, audio aids, and so on, to facilitate effective learning and academic success for students with impairments, should be done.
- A holistic approach to supporting students with disabilities by addressing student-based factors, teacher-based factors and school-based factors should be adopted.

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## Assessing the Degree of Technology Integration in Teaching among Public Schools Teachers in Abuja Municipal Council Area (AMAC)

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**Abstract.** The integration of technology in education is a critical focus in contemporary pedagogical discourse, particularly in developing countries where educational reforms are essential for national development. In Nigeria, policies and initiatives have been established to promote digital literacy and enhance educational quality, but challenges such as insufficient infrastructure and inadequate teacher training persist. This study investigates the degree of technology integration among public school teachers in the Abuja Municipal Area Council (AMAC) and examines the role of school administrators in enhancing teachers' capacity to integrate technology into teaching.

Employing a descriptive survey design, the study sampled 200 teachers from 21 public secondary schools within AMAC. A structured questionnaire, utilizing a 4-point Likert scale, was administered to gather data on teachers' technology integration practices and the support provided by school administrators. The instrument's reliability was confirmed through a pilot test, yielding a Cronbach's alpha coefficient of 0.85. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to analyze the data, alongside a one-sample t-test to evaluate the study's hypothesis. The findings revealed a moderate level of technology integration among teachers, with a grand mean of 2.78, indicating general agreement on the use of technology in instruction. The hypothesis test showed that the impact of administrators in enhancing technology integration was not statistically significant ( $p = 0.051$ ). These findings suggest a need for improved infrastructure, enhanced administrative support, to better equip teachers for effective technology integration, ultimately contributing to the broader educational reforms essential for national development.

**Keywords:** Technology Integration, Teacher Capacity, Digital Education, School Administration

### 1. Introduction

The integration of technology in education has become a critical focus in contemporary pedagogical discourse, particularly in developing countries where educational reforms are essential for national development (Ololube, 2015). Technology integration in education involves the use of various technological tools and resources, such as computers, the internet, digital projectors, educational software, and interactive whiteboards, to enhance the educational experience. The incorporation of digital tools and resources into teaching is vital for enhancing instructional methods, engaging students, and improving learning outcomes (Bebell & O'Dwyer, 2010). The importance of this integration cannot be overstated, as it prepares students for the demands of the 21st-century workforce and fosters innovative teaching practices.

In Nigeria, the Federal Government has recognized the significance of technology in education through various policies and initiatives aimed at promoting digital literacy and enhancing educational quality. Programs such as the National Policy on Information and Communication Technology (ICT) in Education and the Digital Literacy Framework for Nigerian Education (Federal Ministry of Education, 2019) reflect the government's commitment to integrating technology into the educational system. Effective integration can lead to improved student engagement, personalized learning experiences, and better academic outcomes (Lim et al., 2013). It also prepares students for the technologically driven world they will enter upon graduation (Ghavifekr & Rosdy, 2015).

Teachers play a pivotal role in the successful integration of technology in the classroom. Their attitudes towards technology, level of competence, and willingness to adopt new teaching methods significantly influence the effectiveness of technology use in education. Research by Inan and Lowther (2010) highlights that teachers' positive attitudes towards technology are crucial for its effective integration into teaching practices. When teachers perceive technology as beneficial and are confident in their ability to use it, they are more likely to integrate it into their instruction. This positive attitude fosters a more dynamic and engaging learning environment, enhancing students' educational experiences and outcomes.

Moreover, the competence of teachers in using technological tools is a critical factor in successful technology integration. Teachers who are proficient in using digital resources can more effectively incorporate these tools into their teaching strategies, leading to improved instructional methods and student engagement (Inan & Lowther, 2010). Continuous professional development and training are essential to ensure that teachers maintain a high level of competence and stay updated with the latest technological advancements and educational applications.

Willingness to adopt new teaching methods is another significant aspect influencing technology integration. Teachers who are open to experimenting with innovative instructional strategies and incorporating technology into their pedagogy are more likely to create interactive and student-centered learning environments. This willingness to embrace change is vital for the sustainable integration of technology in education, as it encourages ongoing improvement and adaptation to new educational challenges and opportunities.

School administrators also play a crucial role in supporting teachers' efforts to integrate technology. According to Ertmer et al. (2012), administrators are responsible for providing the necessary resources, support, and professional development opportunities for teachers. By ensuring that teachers have access to modern technological tools and are equipped with the skills needed to use them effectively, administrators can create a conducive environment for technology integration. Additionally, administrators can facilitate collaborative professional learning communities where teachers can share best practices, challenges, and innovative ideas related to technology use in education. Fostering a culture of innovation and

continuous improvement within schools is essential for sustainable technology integration. Administrators can promote this culture by encouraging teachers to experiment with new technologies and teaching methods, providing regular feedback, and recognizing and rewarding successful integration efforts (Ertmer et al., 2012). Creating a supportive and collaborative school environment where teachers feel empowered to explore and implement technological innovations can lead to more effective and widespread use of technology in the classroom.

Despite its potential, integrating technology in education faces several challenges. These include insufficient infrastructure, lack of training for teachers, resistance to change, and limited access to digital resources. In developing regions, such as parts of Nigeria, these challenges are often exacerbated by inadequate funding and inconsistent policy implementation (Ololube, 2006). This study therefore seeks to assess the degree of technology integration among public school teachers and to determine the extent to which school administrators enhancing teachers' capacity to integrate technology into teaching in the Abuja Municipal Area Council (AMAC).

### 1.1 Research Questions and Hypothesis

This study is guided by the following research questions:

- What is the level of technology integration among teachers in public secondary schools within the Abuja Municipal Area Council (AMAC)?
- How do school administrators contribute to enhancing teachers' capacity to integrate technology into teaching?

Based on these research questions, the study tests the following hypothesis:

Ho 1. School administrators do not significantly enhance teachers' capacity to integrate technology into teaching.

## 2. Conceptual Framework

### 2.1 Importance of Technology Integration in Teaching

Technology integration in teaching refers to the incorporation of digital tools and resources into the educational process to enhance learning experiences and outcomes. This includes the use of computers, the internet, digital projectors, educational software, and

interactive whiteboards to support and enrich traditional teaching methods (Bebell & O'Dwyer, 2010). The importance of technology integration lies in its ability to prepare students for the demands of the 21st-century workforce, foster innovative teaching practices, and improve student engagement and learning outcomes (Ghavifekr & Rosdy, 2015). Effective technology integration can personalize learning, facilitate access to a wealth of information, and support collaborative and interactive learning environments (Lim et al., 2013).

## 2.2 Levels and Models of Technology Integration

Technology integration can occur at various levels, from basic to advanced. At the basic level, technology is used to support traditional teaching methods, such as using PowerPoint presentations or digital textbooks. At the intermediate level, technology enhances the teaching and learning process through interactive and multimedia resources. At the advanced level, technology transforms education by enabling personalized, student-centered learning experiences and fostering critical thinking and problem-solving skills (Hughes, 2005).

Several models guide the process of technology integration in education. The Substitution, Augmentation, Modification, and Redefinition (SAMR) model, developed by Ruben Puentedura, provides a framework for evaluating and designing learning activities that integrate technology (Puentedura, 2014). The Technological Pedagogical Content Knowledge (TPACK) model, introduced by Mishra and Koehler (2006), emphasizes the intersection of technology, pedagogy, and content knowledge as essential for effective technology integration. These models help educators understand how to use technology to enhance and transform teaching and learning.

## 2.3 The Role of School Administrators in Technology Integration

School administrators play a crucial role in the successful integration of technology in education. They are responsible for providing the necessary resources, infrastructure, and support for technology use in schools (Ertmer et al., 2012). Administrators can foster a culture of innovation by promoting professional development opportunities for teachers, encouraging collaboration and sharing of best practices, and recognizing and rewarding effective technology integration efforts.

## 3. Theoretical Framework

Several theories underpin the integration of technology in education. Constructivist theories, such as those proposed by Piaget (1970) and Vygotsky (1978), emphasize the active role of learners in constructing knowledge through interaction with their environment. These theories support the use of technology to create interactive and engaging learning experiences that promote critical thinking and problem-solving skills. The Diffusion of Innovations theory by Rogers (2003) explains how new ideas and technologies spread within a society or organization. This theory is relevant to understanding how technology integration in education can be facilitated and the factors that influence teachers' adoption of new technologies.

The SAMR model, developed by Dr. Ruben Puentedura, provides a framework for evaluating and designing learning activities that integrate technology (Puentedura, 2014). The model outlines four levels of technology integration: Substitution (technology acts as a direct substitute for traditional tools), Augmentation (technology enhances traditional tools), Modification (technology allows for significant task redesign), and Redefinition (technology enables the creation of new, previously inconceivable tasks).

## 4. Empirical Review

Research has shown that effective technology integration can enhance student engagement, improve learning outcomes, and foster innovative teaching practices. For example, a study by Bebell and O'Dwyer (2010) found that technology integration in classrooms led to increased student motivation and participation. Similarly, Ghavifekr and Rosdy (2015) reported that technology integration improved students' critical thinking and problem-solving skills.

However, several challenges hinder the successful integration of technology in education, including insufficient infrastructure, lack of training for teachers, and resistance to change (Ololube, 2015). Studies have highlighted the need for ongoing professional development and support for teachers to ensure they have the necessary skills and confidence to use technology effectively in their classrooms (Inan & Lowther, 2010).

Research has also examined the role of school administrators in supporting technology integration. Ertmer et al. (2012) found that administrators play a critical role in providing the necessary resources, infrastructure, and professional development

opportunities for teachers. Administrators who promote a culture of innovation and continuous improvement can significantly enhance teachers' capacity to integrate technology into their instructional practices.

While previous studies have highlighted the benefits and challenges of technology integration, there is a need for more research on the specific factors that influence teachers' attitudes towards technology and their willingness to adopt new teaching methods. Additionally, more research is needed on the role of school administrators in promoting and sustaining technology integration initiatives, particularly in developing regions such as Nigeria. This study aims to address these gaps by assessing the degree of technology integration in teaching among public school teachers in the Abuja Municipal Area Council (AMAC) and examining the role of school administrators in this process.

### 5. Research Methodology

This study adopted a descriptive survey design to assess the degree of technology integration among public school teachers in the Abuja Municipal Area Council (AMAC) and to examine the role of school administrators in enhancing teachers' capacity to integrate technology into teaching.

The population of the study comprised all teachers in public secondary schools within AMAC. According to FCT-EMIS, there are 21 public senior secondary schools in AMAC. A sample size of 200 teachers was used. using simple random sampling technique, 10

schools were selected while 10 teachers were randomly picked from each of the schools

A structured questionnaire was developed using a 4-point Likert scale format, ranging from "Strongly Agree" to "Strongly Disagree." This format facilitated the collection of respondents' opinions regarding technology integration and pedagogical practices (Creswell, 2014). Before the main data collection, a pilot test was conducted with a small sample of teachers not included in the selected sample to assess the reliability of the questionnaire. Internal consistency was measured using Cronbach's alpha coefficient, with a resulting index of 0.85, indicating strong item consistency and stability.

Permission was obtained from relevant authorities before distributing the questionnaires to selected teachers. The final version of the questionnaire was administered to the selected sample of teachers. Collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were computed to provide a comprehensive overview of teachers' responses regarding technology integration levels and administrative roles. Inferential statistic- one-sample t-tests was employed to test the hypothesis. Ethical guidelines were strictly followed throughout the research process to ensure the confidentiality and anonymity of participants. All participants provided informed consent before participating in the study, and their voluntary participation was emphasized.

### 6. Result of Findings

**Research Question:** Determine the level of technology integration among teachers in public secondary schools within the Abuja Municipal Area Council (AMAC)

**Table 1:** Level of technology integration among teachers

S/N	Items	SA	A	D	SD	X	SD	Decision
1	Technology is regularly used in classroom instruction	50 (25.0%)	45 (22.5%)	60 (30.0%)	45 (22.5%)	2.51	1.094	Agreed
2	Digital devices, such as computers or tablets, are readily used for teaching and learning	45 (22.5%)	51 (25.5%)	61 (30.5%)	43 (21.5%)	2.49	1.066	Disagreed
3	Lessons often include multimedia elements, such as videos or interactive simulations	60 (30.0%)	65 (32.5%)	45 (22.5%)	30 (15.0%)	2.78	1.039	Agreed
4	Assignments and assessments are sometimes electronically	60 (30.0%)	65 (32.5%)	55 (27.5%)	20 (10.0%)	2.83	0.974	Agreed
5	Technology is integrated into various subjects and not limited to specific courses.	75 (37.5%)	70 (35.0%)	30 (15.0%)	25 (12.5%)	2.98	1.015	Agreed
6	Teachers encourage students to use technology for research and learning beyond the classroom	85 (42.5%)	50 (25.0%)	40 (20.0%)	25 (12.5%)	2.98	1.015	Agreed

7	There is a dedicated technology curriculum or course in the school's educational program	50 (25.0%)	45 (22.5%)	60 (30.0%)	45 (22.5%)	2.50	1.098	Agreed
	Grand Mean					2.78		

Field Survey, 2024

The table1 outlines the responses of teachers regarding the level of technology integration in their teaching practices within public secondary schools in the Abuja Municipal Area Council (AMAC). The table reveals that technology is generally used in classroom instruction, as indicated by a mean score of 2.51, suggesting a slight agreement among teachers. However, there is a noticeable disagreement (mean score of 2.49) on the availability of digital devices for teaching and learning,

Multimedia elements are moderately included in lessons, with a mean score of 2.78, indicating that teachers often incorporate videos and interactive simulations into their teaching. Similarly, there is moderate agreement (mean score of 2.83) that assignments and assessments are sometimes completed electronically, reflecting a fair level of electronic integration in evaluation processes.

The integration of technology across various subjects is positively perceived, as shown by a mean score of 2.98. This suggests that technology is not confined to specific courses but is used across different subjects. Teachers also encourage students to use technology for research and learning beyond the classroom, with a mean score of 2.98, indicating a strong agreement on promoting technological engagement outside school hours.

There is slight agreement (mean score of 2.50) on the presence of a dedicated technology curriculum in schools, although opinions are mixed. Overall, the grand mean of 2.78 reflects a general agreement towards the integration of technology among teachers in public secondary schools within AMAC.

**Research Question:** Examine the roles of school administrators in enhancing teachers’ capacity to integrate technology into teaching

**Table 2:** Roles of school administrators in enhancing teachers’ capacity to integrate technology into teaching

S/N	Items	SA	A	D	SD	<u>X</u>	SD	Decision
1	School principals actively encourage teachers to explore innovative uses of technology in the classroom	79 (39.5%)	58 (29.0%)	40 (20.0%)	23 (11.5%)	2.97	1.03	Agreed
2	Administrative support is readily available when teachers encounter challenges with technology integration	40 (20.0%)	30 (15.0%)	75 (37.0%)	55 (27.5%)	2.28	1.07	Disagreed
3	School Administrators provide opportunities for professional development that focused on technology integration	76 (38.0%)	69 (34.5%)	31 (15.5%)	24 (12.0%)	2.98	1.02	Agreed
4	Administrative policies promote a culture of experimentation and innovation in teaching with technology	75 (37.0%)	85 (42.5%)	21 (10.5%)	19	3.08	0.926	Agreed
5	Teachers feel motivated to integrate technology because they receive recognition and appreciation from school administrators	45 (22.5%)	30 (15.0%)	85 (42.5%)	40 (20.0%)	2.40	1.047	Disagreed
6	administrator access and update technological resources and tools for teaching.	79 (39.5%)	58 (29.0%)	40 (20.0%)	23 (11.5%)	2.97	1.029	Agreed
7	School administrators involve teachers in decision-making processes related to technology adoption and integration	45 (22.5%)	45 (22.5%)	65 (32.5%)	45 (22.5%)	2.45	1.074	Disagreed
	Grand Mean						2.73	

Field Survey, 2024

Table 2. reveals the mean scores of respondents' opinions on the roles of school administrators in enhancing teachers' capacity to integrate technology into teaching. Items 1 through 7 have mean scores of 2.97, 2.28, 2.98, 3.08, 2.40, 2.97, and 2.45, respectively. These scores specify the level of agreement with the statements provided.

The mean score of 2.97 for item 1 indicates a general agreement that school principals actively encourage teachers to explore innovative uses of technology in the classroom. Item 2, with a mean score of 2.28, shows disagreement regarding the availability of administrative support when teachers encounter challenges with technology integration. The mean score of 2.98 for item 3 reflects agreement that school administrators provide opportunities for professional development focused on technology integration. Item 4 has the highest mean score of 3.08, indicating strong agreement that administrative policies promote a culture of experimentation and innovation in teaching with technology. The mean score of 2.40 for item 5 shows disagreement that teachers feel motivated to integrate technology because they receive recognition and appreciation from school administrators. With a mean score of 2.97, item 6 suggests that administrators access and update technological resources and tools for teaching, indicating general agreement. Finally, item 7, with a mean score of 2.45, shows disagreement regarding the involvement of teachers in decision-making processes related to technology adoption and integration.

The grand mean of 2.73 reflects an overall agreement towards the roles of school administrators in enhancing teachers' capacity to integrate technology. While there is positive agreement on several aspects such as encouragement for innovation, professional development opportunities, and promoting a culture of innovation, challenges remain in areas like administrative support during challenges and involvement in decision-making processes related to technology

**Test of Hypotheses**

Ho<sub>1</sub>: Administrators do not significantly enhance teachers' capacity to integrate technology into teaching.

**Table 3:** One-Sample t-Test Results for Administrator's Role in Enhancing Technology Integration

Statistic	Value
Hypothesized Mean ( $\mu$ )	2.5
Sample Mean ( $\bar{X}$ )	2.73
Standard Deviation (SD)	0.26
Number of Items (n)	7
Degrees of Freedom (df)	6
t-Statistic (t)	2.43
p-Value	0.051
Significance Level ( $\alpha$ )	0.05
Decision (Reject/Fail to Reject Ho <sub>1</sub> )	Fail to Reject Ho <sub>1</sub>

**Decision Criteria**

If p-value < 0.05: Reject the null hypothesis (Ho<sub>1</sub>).

If p-value ≥ 0.05: Fail to reject the null hypothesis (Ho<sub>1</sub>).

**Interpretation**

p-Value = 0.051: the p-value is slightly greater than 0.05, we fail to reject the null hypothesis (Ho<sub>1</sub>).

The one-sample t-test results indicated a p-value of 0.051, slightly above the 0.05 significance level. Therefore, the null hypothesis—that administrators do not significantly enhance teachers' capacity to integrate technology into teaching—was not rejected. This suggests that while administrators play a supportive role, their impact is not statistically significant, pointing to areas needing further enhancement and focus

## 7. Discussion of Findings

The study found that technology is moderately used in classroom instruction, among teachers in AMAC, while some teachers actively integrate digital tools into their teaching practices, there is still room for improvement in the consistent use of technology across all classrooms. The findings of the study align with and expand upon existing literature on technology integration in education. The moderate use of technology in classroom instruction is consistent with Bebell and O'Dwyer's (2010) assertion that while technology has the potential to enhance education, its integration varies significantly among teachers. This variability often results from differences in resource availability and teacher preparedness.

The study also identified significant challenge which is the limited availability of digital devices for teaching and learning, this suggests that despite the interest and willingness of teachers to use technology, the lack of adequate resources hinders full integration. The findings echo the challenges highlighted by Ololube (2015) and Inan and Lowther (2010). Both studies emphasize the need for sufficient infrastructure and resources to support effective technology integration. Without adequate access to digital tools, teachers are unable to fully implement technology-enhanced teaching practices

The positive trend towards integrating technology across various subjects is supported by Ghavifekr and Rosdy (2015), who advocate for the use of technology to enrich the educational experience across the curriculum. This comprehensive approach to technology integration ensures that students are well-prepared for the demands of the 21st-century workforce.

The study also found that school administrators play a supportive role in enhancing teachers' capacity to integrate technology in teaching. However, challenges remain, particularly in areas such as providing administrative support during challenges and involving teachers in decision-making processes related to technology. This indicates that while there is some encouragement and professional development opportunities, more comprehensive and effective administrative support is needed. The supportive yet insufficient role of school administrators in enhancing teachers' capacity to integrate technology reflects the findings of Ertmer et al. (2012). While administrators play a crucial role in providing resources and promoting a culture of innovation, the study reveals gaps in administrative support during challenges and in decision-making processes. This indicates a need

for more comprehensive and effective administrative strategies to fully support technology integration.

In summary, while there is a general agreement on the importance and benefits of technology integration in teaching, significant challenges remain. Addressing these challenges requires a concerted effort from both educators and administrators to ensure that resources are available, support systems are in place, and teachers are actively involved in decision-making processes related to technology adoption and integration.

## 8. Conclusion

The study reveals a moderate level of technology integration in classroom instruction. While teachers demonstrate a willingness to incorporate digital tools and resources, challenges such as limited availability of digital devices and insufficient administrative support hinder full integration. The study highlights that technology is being used across various subjects, promoting a comprehensive approach to education.

Teachers also encourage technological engagement beyond the classroom, fostering continuous learning. However, the role of school administrators, though supportive, needs enhancement, particularly in providing consistent administrative support and involving teachers in decision-making processes. The study's findings emphasize the need for a more robust and collaborative effort to overcome these challenges and fully harness the potential of technology in education. This comprehensive integration is essential for preparing students for the demands of the 21st-century workforce and fostering innovative teaching practices.

## 9. Recommendations

Based on the findings of this study, the following recommendations are made to improve technology integration in teaching among public schools in the Abuja Municipal Area Council:

- The government and educational stakeholders should invest in providing adequate digital devices such as computers, tablets, and interactive whiteboards. Ensuring that all classrooms are equipped with necessary technological tools will enhance teachers' ability to integrate technology effectively into their teaching practices.
- Continuous professional development and training programs focusing on technology integration should be provided for teachers. These programs should include hands-on training, workshops, and seminars

that equip teachers with the skills and confidence needed to use digital tools and resources effectively.

- School administrators should provide consistent and accessible support to teachers facing challenges with technology integration. This includes creating a helpdesk or support team dedicated to addressing technological issues and ensuring timely resolution of problems.

- Adequate funding should be allocated to support the infrastructure and resources needed for technology integration. This includes not only purchasing digital devices but also ensuring reliable internet connectivity, maintenance of equipment, and provision of educational software and tools.

- Schools should implement a dedicated technology curriculum or course within their educational programs. This curriculum should cover digital literacy, coding, and other relevant technological skills, preparing students for the digital age.

- Regular monitoring and evaluation of technology integration efforts should be conducted to assess progress and identify areas needing improvement. This can be achieved through surveys, classroom observations, and feedback from teachers and students.

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## Think-Pair-Share Instructional Strategy and its Effects on Upper Basic Social Studies Students' Academic Performance in Delta State

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**Abstract.** This study looked at the effects of think-pair-share teaching method on the academic performance of Upper Basic Social Studies students. The study used a 2x2x2 non-randomized retest with a post-test control group in a quasi-experimental setup. Two hypotheses and two research questions served as the study's compass. 170 basic 8 students from six groups; three control groups and three experimental groups made up the study's sample size. The Social Studies Performance test was utilized to gather the data, and the Pearson Product Moment Correlation Coefficient ( $r$ ) was employed to assess and interpret the results. A reliability coefficient of 0.75 was attained. The null hypotheses were tested using ANCOVA at the 0.05 level of significance, and the data were analyzed using the mean and standard deviation. The findings demonstrated that students taught Social Studies using the think-pair-share technique outperformed those taught using the lecture method in terms of academic performance. The findings also showed that students' academic performance was significantly impacted by the school's location. Based on the results, it was suggested that think-pair-share be used as an instructional strategy and that students from rural and urban areas should have equal access to education in schools.

**Keywords:** Think-Pair-Share Instructional Strategy, School Location, Academic Performance.

### 1. Introduction

The academic performance of students helps teachers recognize their own inadequacies in the teaching process, enhance the quality of their instruction,

sharpen their teaching abilities, and modify their instructional tactics as needed (Fisher & Bandy, 2019). According to Kumar et al. (2021) academic success may be defined as a behavior that can be measured across the course of learning. In order to improve students' academic performance, it is crucial to implement instructional practices that encourage active student engagement in the teaching-learning process.

According to Barmiro (2015), the think-pair-share instructional technique is a learning scenario that promotes critical thinking and collaboration among students. In 1980, Professor Frank Lyman created the think-pair-share model. Enhancing the learning process is the strategy's main objective (Dorji & Chalermnirundor, 2021). Three phases make up the think-pair-share educational strategy: thinking, discussing ideas with other students, and voicing opinions in front of the class. Students' thinking time integrates their conceptual understanding of the material.

According to Yusuf, Owede, and Bellow (2018), the think-pair-share instructional technique enhances learning's social and cognitive components and eventually results in the discovery of new information.

Think-pair-share entails giving students an assignment and allowing them time to reflect on their own to find a solution to an issue or response to a teacher's inquiry. Since social studies covers societal concerns, critical thinking, and problem solving, it is believed that using this technique in the classroom is acceptable. The think-pair-share teaching method enhances students' capacity for critical thought and problem solving,

which benefits their academic achievement (Agbede & Ba'aba, 2019).

The site of the school is known as the school location. While some schools are found in urban settings, others are found in rural ones (villages). The school's location is very important. The capacity of students to learn and do well in school may be impacted by a school's location, whether it be rural or urban (Ntibi & Edoho, 2017). Location variations as well as variations in the caliber of instruction between locations may have an impact on students' degree of knowledge acquisition. This implies that the kids may be affected academically by the resources and learning materials they are exposed to. Generally speaking, metropolitan schools receive greater government support, funding, and social amenities than do rural schools.

### 1.1 Statement of the Problem

The kind of instructional method a teacher uses when instructing has been found to have a significant impact on students' academic achievement. For students to achieve better academically, they must actively participate in the learning process. Notwithstanding the significance of student-centered instructional methodologies, it has been noted that the majority of Delta State's Upper Basic schools use the teacher-centered teaching approach, which treats students as passive participants in the teaching-learning process. It's possible that the traditional (lecture) approach of teaching social studies in Upper Basic schools does not adequately address the unique learning styles and interests of each student. The degree of students' academic performance may be hampered by their disengagement from teaching-learning activities. Therefore, it is necessary to investigate the potential impact of the think-pair-share teaching technique on the academic performance of upper basic Social Studies students.

### 1.2 Purpose of the Study

The study's main goal is to find out how think-pair-share teaching methods affect Delta State upper basic social studies students' academic achievement. The study specifically aims to:

- determine the disparity in academic achievement between students taught Social Studies using the lecture technique and those taught using the think-pair-share teaching strategy.
- Determine if Upper Basic students taught Social Studies using the think-pair-share instructional technique in urban and rural areas performed differently academically.

### 1.3 Research Questions

To guide the study, the following research questions were raised:

- What is the difference between the academic performance of Upper Basic students taught Social Studies with the use of think-pair-share instructional strategy and those taught with the use of lecture method?
- What is the difference between the academic performance of urban and rural Upper Basic students taught Social Studies with think-pair-share instructional strategy?

### 1.4 Hypotheses

To guide the study, the following hypotheses were formulated:

**HO1:** There is no significant difference between the academic performance of Upper Basic students taught Social Studies with the use of think-pair-share instructional strategy and those taught with the use of lecture method.

**HO2:** There is no significant difference between the academic performance of urban and rural Upper Basic students taught Social Studies with think-pair-share instructional strategy.

## 2. Think-Pair-Share Instructional Strategy and Academic Performance of Students

In order to teach and understand Social Studies and equip students to be problem solvers in society, active student engagement is crucial. Think-pair-share is a cooperative learning approach that allows students to collaborate to find a solution to a problem or provide an answer to a question posed by their instructor (Barmiro, 2015). By giving students the chance to actively participate in the teaching-learning process, the think-pair-share instructional technique improves their academic achievement. The teaching approach requires students to consider a subject or provide a solution to a question on their own and to collaborate with other students on ideas. Talking with peers about a topic helps students understand it better. The think-pair-share educational technique allows students to learn cooperatively in pairs and provides them with more time to reflect, answer, and support one another. In Bayelsa State, Nigeria, Yusuf et al. (2018), looked at how the think-pair teaching method affected students' civic education performance. According to the study's findings, students who were taught the think-pair-share instructional style scored better

academically than those who were taught the traditional way.

Akanmu (2019), looked at how senior high school students in Ilorin, Nigeria performed in mathematics after using a think-pair-share instructional technique. The results of the study showed a substantial variation in the academic performance of students according to the teaching strategy. Students who were taught mathematics via the think-pair instructional style did better than those who were taught through the conventional way. In order to find out how the think-pair-share teaching method affected the reading proficiency of Panyabunga 7th grade students during the 2019–2020 school year, Hasibuan (2019) conducted a research. There were 28 students in the sample size of this action research project. The data collection tool was the accomplishment test. Both descriptive and inferential statistics were applied to the data analysis. The results of the study showed that think-pair-share improved students' academic achievement.

Agbede and Ba'aba (2019), studied how students' academic performance in accounting in North-East Nigerian institutions of education was affected by the use of think-pair-share and jigsaw approaches. The study used a quasi-experimental approach with 120 students as the sample size. The data collection tool was the accomplishment test. Regression analysis, standard deviation, and mean were used to examine the data. The results of the study showed that the think-pair-share teaching method improved students' academic achievement.

Uzoma and Okoli (2019), looked at how the think-pair-share teaching method affected the academic achievement of secondary school biology students.

The research employed a quasi-experimental design. Thirty-eight male and thirty-five female senior secondary class two (SS2) biology students from two public coeducational schools in Anambra East Local Government Area, Anambra State, made up the study's sample. There were forty students in the experimental group (thirteen girls and twenty-three males), compared to 33 in the control group. A purposeful sampling technique was used to choose the sample. The instrument utilized to collect the data was the biology performance test. The experimental group was trained utilizing the think-pair-share method, whereas the control group got conventional training. The mean and standard deviation were utilized to offer responses to the research questions, while analysis of covariance was performed to test the null hypotheses at the 0.05 level of significance. The study's conclusions showed

that biology students' mean academic performance scores varied significantly. The results of the study showed that, in terms of academic achievement, students who learnt biology using the think-pair-share method scored better than those who learned the subject through traditional methods.

Punwalalai and Pavida (2020), studied think-pair-share forms for reading comprehension. The results of the study demonstrated that think-pair-share had a significant effect on students' academic performance. A study published by Parker and Asare (2021), examined how teacher candidates perceived the think-pair-share method of teaching living organism categorization in education colleges located in the Aowin Municipality in Ghana's Western North Region. The study's conclusions showed that the think-pair-share intuitional technique enhances students' academic achievement, motivates and engages learners, and offers quick feedback. It also helps learners build their social and physical abilities.

In order to ascertain the impact of the think-pair-share teaching technique on primary students' comprehension of science topics, Ateeq et al. (2021), carried out a research in District Toba Tek Singh. Sixty students were specifically selected for the study, making up the sample size. An accomplishment test was the tool employed in this experimental research design investigation. Both descriptive and inferential statistics were applied to the data analysis. The results of the study showed that the think-pair-share teaching method improved students' academic achievement. The application of think-pair-share to raise students' learning satisfaction and accomplishment in Social Studies in sixth-grade Thailand was studied by Dorji and Chalermnirunorn (2021). According to the study, students who were taught think-pair-share outperformed students who were taught traditional approaches in terms of academic performance. Karura et al. (2021) looked at how the think-pair-share teaching method affected the motivation and academic performance of students in C.R.E. in Nakuru Country. The think-pair-share educational technique enhanced students' academic achievement, according to the study's findings. Ogbaga and Osuafor (2022) examined the impact of the think-pair-share teaching approach on secondary school biology students' performance in the Awka Education Zone. The study's findings demonstrated that, in terms of their mean academic performance scores, learners who were taught the think-pair-share approach differed significantly from those who were taught the traditional strategy.

### 3. School Location and Academic Performance of Students

Bamidele and Adekola (2017), conducted a research in the Ibarapa Region of Oyo State to ascertain the relationship between gender and students' academic achievement in junior secondary school basic science. For 450 randomly selected JSS II students, a survey study approach was used; socioeconomic status and gender were used as performance indicators for academics, and data were analyzed using t-test statistics. The study's conclusions indicated that male and female students performed significantly differently academically. In Makambako town council, Njobabe, Tanzania, Mhiliwa (2015), examined the impact of school location on students' academic performance. The study involved 200 students, 12 instructors, and two educational supervisors. The study found that students' academic performance was influenced by their school's location, with urban students performing better.

At a college of education in Cross River State, Nigeria, Essien (2017) studied the effect of school location on students' academic progress in Social Studies. Seven hundred and fifty-three students were randomly selected to comprise the study's sample. Data were gathered for the study utilizing an achievement exam and a questionnaire with a descriptive research design. ANONA statistics and the t-test were used to evaluate the data. The study discovered that the location of the students' school had no impact on their academic achievement. The study's conclusions demonstrated that there was no discernible difference in the scholastic achievement of urban and rural students in Social Studies.

Adebayo et al. (2018) looked into how home economics students in Ekiti State, Nigeria performed academically on the junior secondary school certificate test in relation to their school's location. One hundred randomly selected home economics students made up the study's sample. A questionnaire was utilized as the data collection tool in this descriptive research study. T-test statistics were applied to the data analysis. The study discovered that the location of the students' school had no impact on their academic achievement. The study's conclusions demonstrated that there was no discernible difference in home economics students' academic performance based on where they attended school.

In the Isokan Local Government Area of Osun State, Nigeria, Babawale (2019) looked at the relationship between senior secondary students' academic achievement and their school's location. 158 economics students that were specifically selected for

the study made up the study's sample. A questionnaire was utilized as the data collection tool in this descriptive research study. The t-test statistic was used to assess the data. In terms of academic achievement, the study found that children in urban schools did better than those in rural schools. The study's conclusions demonstrated that, when it came to school location, economics students' academic performance differed significantly.

Ovat et al. (2021) studied how students' academic achievement, class size, and school location were evaluated in Cross River State, Niger. 1600 Basic 8 students were included in the study's sample, which was selected at random. A questionnaire was utilized as the data collection tool in this descriptive research study. ANONA statistics and the t-test were used to evaluate the data. The results of the study showed that the location of the school had an impact on the academic achievement of the students. Academically, urban schoolchildren scored better than those in rural schools, according to the survey.

Ikechuku (2021) used the 5E learning cycle to examine the impact of school location on students' academic progress in senior secondary physics in Delta State, Nigeria. 113 students that were specifically selected for the study made up the sample size. A test of achievement was utilized as the data gathering tool in this quasi-experimental research project. Statistics such as mean, standard deviation, and ANOVA were used to examine the data. There was no discernible difference in academic achievement between urban and rural kids, according to the survey. In 2020, Akpomudjere conducted a study to examine the effects of school location on students' academic performance. The study included 2579 Business Studies students from Sapele Local Government Area in Delta State. The findings of the study indicated that there was no significant correlation between school location and academic performance.

According to the literature review, no research on teaching methods has been done to determine how think-pair-share affects students' academic achievement in social studies in Delta State's upper basic schools. Therefore, the purpose of this study is to ascertain how think-pair-share affects the academic achievement of upper basic school Social Studies students in Delta State. Scholarly literature has indicated that school location affects students' academic achievement. However, there is debate regarding whether students in urban schools outperformed their rural counterparts in terms of academic performance. Therefore, further study on the

relationship between students' academic performance and school location is necessary.

#### 4. Methodology

The study employed a quasi-experimental approach with a pre-test-post-test control group. The participants in the research were all Delta State Basic 8 students. The population consisted of 45,672 Basic 8 students from the 468 public Upper Basic schools in Delta State. Using multi-stage selection procedures, 170 Basic 8 students were chosen as a sample from eleven different schools. The study's tool was the Social Studies Performance Test (SSPT). The reliability of the instrument was assessed using the test-retest method. There were two weeks in between each exam. This demonstrated how the students' answers remained consistent over time. The Pearson Product Moment correlation was used to assess the reliability; the result was 0.75. This suggests that the

instrument generated ratings that are reliable over time and, thus, suitable for the study under consideration. Following the student selection process and method assignment, the Social Studies Performance Test (SSPT) was administered as a pre-test in the intact classrooms of the randomly selected research schools. After then, the curriculum's themes were taught utilizing the proper teaching techniques. The experimental and control groups received teaching from the researcher. The Social Studies Performance Test (SSPT) was administered as a post-test and graded to the students in the treatment and control groups following instruction based on the required therapy. The Pre-test and Post-test data were subjected to statistical analysis utilizing descriptive statistics, namely Mean and Standard Deviation. These made it easier to distinguish between the differences in the subjects' performance. Using the Analysis of Covariance (ANCOVA) approach, the hypotheses were evaluated.

#### 5. Results

**Research Question 1:** What is the difference between the academic performance of Upper Basic students taught Social Studies with the use of think-pair-share instructional strategy and those taught with the use of lecture method?

**Table 1:** Mean difference between the academic performance of Upper Basic social studies students taught with think-pair-share and lecture method instructional strategy.

Test score	Instructional Strategies	N	Mean	Std. Deviation	Mean Difference	95% Confidence Interval of the Difference	
Pre-Test	Think-Pair- Share	90	47.23	12.67	4.65	15.31	3.96
	Lecture Method	80	51.88	17.60			
Post-Test	Think Pair Share	90	64.48	13.81	7.57	3.73	9.89
	Lecture Method	80	56.91	11.59			

Table 1 examines the descriptive statistics to answer Research Question 1, which compares the academic achievements of Upper Basic students taught Social Studies through the think-pair-share instructional strategy versus those taught through the lecture method. The mean test score differences for students who were exposed to each instructional style are displayed in this table, providing information on the relative efficacy of each approach. Students taught the think-pair-share approach had a mean score of 47.23 on the pre-test, with a standard deviation of 12.67. Students taught the lecture method had a higher mean score of 51.88 on the same exam, with a standard deviation of 17.60. With a 95% confidence range spanning from 3.96 to 15.31, the mean difference between the two groups was 4.65. This suggests that the think-pair-share strategy group's students got a somewhat lower mean score on the pre-test than the lecture method groups. Students who were taught the think-pair-share technique had a mean score of 64.48 on the post-test, with a standard deviation of 13.81 and a standard error mean of 1.79. The mean score of students who were instructed through lectures, on the other hand, was 56.91, with a standard deviation of 11.59 and a standard error mean of 1.00. The post-test results showed a mean difference of 7.57 between the two groups, with a 95% confidence range spanning from 3.73 to 9.89. This indicates that students given the think-pair-share technique outperformed students taught the lecture method following the instructional interventions. The think-pair-share group's increased mean scores between the pre- and post-tests show a discernible improvement in their academic performance. The noteworthy mean difference in the post-test scores emphasizes the efficacy of the think-pair-share approach. This improvement implies that, in comparison to the lecture technique, the think-pair-share strategy produces a more interesting and effective learning environment.

**Research Question 2:** What is the difference between the academic performance of rural and urban Upper Basic students taught Social Studies with think-pair-share instructional strategy?

**Table 2:** Mean difference between the academic performance of rural and Urban Upper Basic social studies students taught with think-pair-share instructional strategy.

Think-Pair-Share Test Score	Location	N	Mean	Std. Deviation	Mean Difference	95% Confidence Interval of the Difference	
						Lower Bound	Upper Bound
Pre-Test	Urban	63	49.15	14.03	4.26	-2.28	10.81
	Rural	27	44.87	10.56			
Post-Test	Urban	63	63.21	13.51	-2.82	-10.04	4.39
	Rural	27	66.04	14.35			

In Social Studies, rural and urban Upper Basic students' academic performance was compared in detail utilizing the think-pair-share instructional technique. The descriptive data are displayed in Table 2. Urban students scored 49.15 on average during the pre-test phase, with a standard deviation of 14.03, while rural students scored somewhat lower at 44.89 with a standard deviation of 10.56. This indicates that there was a marginal difference between urban and rural students' pre-existing knowledge of Social Studies, with urban students scoring slightly better on the mean pre-test. In the post-test phase, the mean score for urban students was 63.21, with a standard deviation of 13.51, while the mean score for rural students was 66.04, with a standard deviation of 14.35. This suggests that, in comparison to urban students, rural students did somewhat better on the post-test phase. Urban students had a somewhat higher mean pre-test score than rural students, as indicated by the 4.26 mean difference in pre-test scores between urban and rural students. In a similar vein, the average difference between post-test scores was 2.82, indicating that students in rural areas had a little higher mean score than students in urban areas.

### Hypotheses Testing and Interpretation

**Ho1:** There is no significant difference between the academic performance of Upper Basic students taught Social Studies with the use of think-pair-share instructional strategy and those taught with the use of lecture method.

**Table 3: Analysis of ANCOVA for Hypothesis one**  
**Dependent Variable: POST-TEST**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	13233.513 <sup>a</sup>	2	6616.756	77.936	.000	.586
Intercept	5898.998	1	5898.998	69482	.000	.387
PRE-TEST	13046.529	1	13046.529	153.670	.000	.583
Think-Pair-Share * Lecture Method	2284.234	1	2284.234	26.905	.000	.197
Error	9338.983	110	84.900			
Total	474984.000	113				
Corrected Total	22572.496	112				

a. R Squared = .586 (Adjusted R Squared = .579)

Regarding the difference in academic achievement between Upper Basic students taught Social Studies using the think-pair-share instructional approach and those taught using the lecture technique, Table 3 displayed the results of the ANCOVA analysis on the hypothesis statement. With a mean square of 6616.756, the data shows a considerable difference in academic achievement between the two teaching styles. The extremely significant F-value of 77.936 ( $p < .001$ ) indicates that there is no chance explanation for the difference in academic achievement between the two instructional modalities.

With a mean square of 269,905, the think-pair-share approach differs significantly from the lecture method. This indicates that the choice of instructional technique can account for 58.6% of the variance in academic achievement. The findings are consistent with rejecting the null hypothesis (Ho1) and accepting the alternative, which holds that academic performance differs significantly between Upper Basic students who are taught Social Studies through the think-pair-share instructional strategy and those who are taught through lecture.

**Ho2:** There is no significant difference between the academic performance of rural and urban Upper Basic students taught Social Studies with think-pair-share instructional strategy.

**Table 4:** Analysis of ANCOVA for Hypothesis Six

**Dependent Variable: POST-TEST**

Source	Type III Squares	Sum of df	Mean Square	F	Sig.	Partial Squared	Eta
Corrected Model	4543.622 <sup>a</sup>	2	2271.811	19.118	.000	.401	
Intercept	4287.938	1	4287.938	36.084	.000	.388	
PRE-TEST	4306.777	1	4306.777	36.243	.000	.389	
Location*Think-Pair-Share	579.059	1	579.059	4.873	.031	.079	
Error	6773.362	57	118.831				
Total	260803.000	60					
Corrected Total	11316.983	59					

a. R Squared = .401 (Adjusted R Squared = .380)

The analysis of covariance (ANCOVA) used to compare the academic performance of Upper Basic students in rural and urban areas who were taught Social Studies utilizing the think-pair-share teaching technique was displayed in Table 4. A substantial effect size is indicated by a partial eta squared of .401 and  $F(2, 57) = 19.118, p < .001$ . This implies that the geographical difference accounts for 40.1% of the variance in academic achievement. Even after adjusting for pre-test results,  $F(1, 57) = 36.084, p < .001$  indicates that there was still a substantial academic performance gap between rural and urban students. Additionally, there was a significant influence of the pre-test scores ( $F(1, 57) = 36.243, p < .001$ ), suggesting that there were variations in academic performance before the intervention.

Additionally, there was a significant difference in academic performance between rural and urban students when taking the think-pair-share instructional strategy into account. This was indicated by the significant interaction effect between location and the strategy ( $F(1, 57) = 4.873, p = .031$ ). When taking into account the think-pair-share teaching technique, the results indicate that there was a significant difference in academic achievement between rural and urban students ( $F(1, 57) = 4.873, p = .031$ ). The findings, which show a substantial academic performance gap between rural and urban Upper Basic students taught Social Studies using the think-pair-share teaching technique, supports rejecting the null hypothesis.

## 6. Discussion of Results

The first finding of this study shows that the think-pair-share teaching strategy outperformed the lecture method in improving students' academic performance. This conclusion can be explained by the fact that, in contrast to the lecture technique, which assumes that students are thoughtful listeners, the think-pair-share teaching strategy encourages students to actively participate in the learning process and collaborate with

other students. The think-pair-share teaching method encourages student engagement in class activities, which helps students understand the material being covered. This result is consistent with that of Akanmu (2019), who found a substantial difference between students' academic performance and teaching tactics. According to earlier studies, think-pair-share instruction was more effective than the lecture method in improving students' academic performance. These studies included Barmiro (2015), Raba (2017), Sumekto (2018), Yusuf et al. (2018), Hudri and Irwandi (2019), Kurjum et al. (2020), Linsenmeyer (2021), Ogbaga and Osuafor (2022), and Dorji and Chalermnirundor (2021).

Research conducted by Sesrita (2017), Afran (2018), Syafii (2018), Karura et al. (2021), Parker and Asare (2021) demonstrated that the think-pair-share instructional strategy improves higher order thinking and problem-solving skills in addition to motivating students to participate in class activities. The results of this study are consistent with those of Karura et al. (2021), who claimed that the think-pair-share teaching technique enhanced students' academic performance. Comparably, the outcome supports the conclusions of the following studies: Think-Pair-Share Instructional Strategy; Positive Effect on Students' Academic Performance; Agbede and Ba'aba (2019); Hasibuan (2019); Kurjum et al. (2020); Punwalalai and Pavida (2020); Sapitri et al. (2020); Ogbaga and Osuafor (2022). The results of this study are consistent with those of other studies, which found that the think-pair-share educational strategy was more effective than the lecture technique in improving students' academic performance.

The second result of this study demonstrates a noteworthy disparity in the academic performance of rural and urban students receiving Social Studies education using the think-pair-share method in favour of the rural students. The results of this study support the idea that, a school's location has an impact on

students' academic performance. This is explained by the possibility that variations in instructional method quality and location can have an impact on students' degree of information acquisition. This result is consistent with research by Owoeye and Yara (2011), Onyekwusi and Ogoamaka (2013), Chianson (2014), Alordiah et al. (2015), Ella and Ita (2017), and Babawale (2019) that found academic performance was higher in urban schools than in rural ones. In a similar vein, Ovat et al. (2021) shown that academically, urban students did better than rural students. Rural students outperformed urban students intellectually, according to a 2015 research by Ikashi. According to research by Agbaje and Omotade (2014), Adebayo et al. (2018), and Ikechuku (2021), there is no discernible relationship between the location of the school and students' academic achievement.

## 7. Conclusion

Based on the findings of the study, it was concluded that:

Compared to the lecture technique, the think-pair-share teaching strategy improved students' academic performance.

Students taught Social Studies with think-pair-share instructional strategy performed differently academically depending on the school's location.

## 8. Recommendations

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

- The use of the Think-Pair-Share instructional technique is recommended as a means of improving students' academic achievement.
- To improve the teaching of Social Studies, in-service teachers should conduct seminars and workshops on instructional methodologies like think-pair-share.
- Students in urban and rural schools should have equal access to learning in the classroom.

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## **Influence Of Aberrant Response Behaviours On Academic Achievement Of Secondary School Students With Physical Disability Status In Niger State, Nigeria**

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**Abstract.** The purpose of this study was to assess the influence of aberrant response behaviour on academic achievement of secondary school students with physical disability. A quasi-experimental design was carried out in 66 public secondary school within Niger State. The study adopted, through a purposive sampling method 98 students with various and varying degrees of physical disabilities, specifically, 75 orthopaedic and 23 visual impaired students currently in SSS III classes. Two self-developed instruments were utilized to collect data; Mathematics-English-Language-Achievement-Test (MELAT); and Proforma for Achievement Scores of Students with Physical Disability (PASS-PD). Data collected were analyzed using descriptive statistics of percentages and Analysis of Variance (ANOVA) at 0.05 level of significant difference. The findings of the investigation revealed that, with cheating and plodding as observed aberrant response behaviours among the subjects, there is statistically significant difference in the academic achievement of students with orthopaedic and visual impairments in Mean Cumulative Academic Achievement (MCAA), Pre-test and Post-test MELAT. This assertion is based on the evident results of 30.32 for difference in the academic achievement of students with orthopaedic impairment, and 13.41 for difference in the academic achievements of students with visual impairments, which are greater than the probability value of 0.00. Academic integrity policies to promote ethical conduct of tests and specialized support services to enhance improved learning experiences and valid outcomes of students with these impairments were recommended.

**Keywords:** Physical disability, Aberrant response pattern, Item response theory, Orthopaedic impairment, Cheating and Plodding

### **1. Introduction**

The journey of academic success or failure, after the conventional treatment of teaching and learning begins with the process of quantifying individual's educational and psychological qualities, such as achievement, personality, attitudes or skills relative to some defined objectives. The numerical outcomes are used to evaluate students which are subsequently expressed in grades such as excellent, good, fair or fail. All these processes are systematically followed to ascertain the quality of education received by the students, which is a fundamental human right for all citizens of the country. The fundamental human right advocates for all the right to quality education and without any form of discrimination. In Nigerian schools and education sector, discrimination against disabled persons varies from peers 'attitude towards disabilities to outright denial of educational opportunities, isolation and stigmatization imposed in forms of social and physical barriers (Talafha, 2022). Disability, though defined as a condition that makes it difficult for a person to perform certain tasks, includes but not limited to intellectual, mental health, hearing and vision disabilities (Ugoma, 2018).

Physical disability is a physical condition that limits a person's ability to function and perform activities ranging from moving, to communicating, to taking care of themselves, which could be temporary or

permanent, mild or severe, apparent or invisible (Banaszak, Clause and Chapel, 2023). Banaszak et al, further opined that, there are many types of physical disabilities ranging from those that affects person's ability to walk, lift objects, or perform other gross motor tasks. While some impede a person's ability to use their senses through sight, hearing, or touch, others impair a person's ability to communicate. Persons with Albinism, though usually may be as healthy as their peers, can be classified as disabled because of the associated visual impairments, Burger (2016), ascertained. However, the effects of physical disability on persons experience in academics vary even for children with the same diagnosis or condition.

The response pattern of children with physical disabilities could be a source for establishing their strength and weaknesses in academics, as such Talafha (2022) emphasized, that: "academic achievement assessment is generally a process of documenting in measurable terms, knowledge, skills, or attitudes which students are required to demonstrate mastery by performing tasks". And from a general perspective, as reported by Nneka and Dickson (2017); poor academic achievement is alleged as a major underlying problem among children that suffers with physical disabilities, hence, a belief that a physical disability in any form is also academic disabilities for students who are admitted into the schools to learn.

Item Response Theory (IRT) is a mathematical theory about examinee (student) item and test performance and how performances relate to the abilities that are measured by the items in test (Ojerinde, Poppola, Ojo and Onyeneho, 2019). Mahmud (2017) proffered that it is an important methodology which has been globally used to analyze students' responses to test items with a goal of improving measurement accuracy and reliability. The focus is on the pattern of responses, where the item responses are considered the outcome variables, and the student's ability and item characteristics are the predictor variables (Bentler, 2021). However, the measurement model may fail to accurately reflect the real aspects of students' responses, thereby showing unusual irregularities, thus compromising the validity of tests scores (Mousavi and Cui, 2020). One of such failure can be found when unusual or unexpected (aberrant) response patterns are produced by the students.

Aberrant response patterns explain the possibility of an examinee obtaining correct answers for wrong reasons when responding to dichotomous scored test items (Kukumi and Maurice, 2018). Aberrant behaviors are usually exhibited in various forms, and gives room for aberrant scores that is not likely to be

true. These behaviors according to Smith and Lamprianou (2016) are such various possible reasons which include cheating, distractions, guessing, copying, extreme creativity, test anxiety, special knowledge among others.

It is therefore important that the validity of academic achievement of students with physical disability at the level of secondary education, especially in inclusive learning programmes be ensured. This has been a source of concern to the researcher, the reason for the investigation on the influence of aberrant response behaviors on their academic achievements.

### 1.1 Statement of the Problem

Developing a valid, reliable and usable measuring instrument, and administering same to accurately portrays students' knowledge level, skill level and/or ability can be a challenging task. It becomes more difficult, especially, where students with physical disabilities and obvious challenges are involved and are expected to be measured and evaluated without overestimating or underestimating their ability in an inclusive learning. It becomes essential that investigation on the effect of aberrant behaviors on academic achievement of secondary schools students with physical disability be launched.

### 1.2 Objective of the Study

- To examine the difference in the academic achievement of students with Orthopedic Impairment status in MCAA, Pre-test MELAT and Post test MELAT.
- To determine the difference in the academic achievement of students with Visual Impairment status in MCAA, Pre-test MELAT and Post test MELAT.

### 1.3 Research Questions

- What is the significant difference in the academic achievement of students with Orthopedic Impairment status in MCAA, Pre-test MELAT and Post test MELAT?
- Is there significant difference in the academic achievement of students with Visual Impairment status in MCAA, Pre-test MELAT and Post test MELAT?

### 1.4 Hypothesis

- There is no significant difference in the academic achievement of students with

Orthopedic Impairment status in MCAA, Pre-test MELAT and Post test MELAT.

- There is no significant difference in the academic achievement of students with Visual Impairment status in MCAA, Pre-test MELAT and Post test MELAT.

## 2. Theoretical Framework

This study utilized Items Response Theory (IRT). The theory was initially developed by a Psychometrician for educational testing services, Frederic Mather Lord in the 1950's and 1960's. IRT refers to a family of mathematical models in the field of psychometrics that attempt to explain the relationship between latent traits (unobservable characteristic) and their manifestation (observed responses/achievement). It connotes and theoretically "assumes that there exists a relatively common trait/characteristic that can be used to determine an individual's ability to succeed with a particular task" (Ojerinde et'al 2019). Such tasks may be in terms of the individual's response by thinking (cognitive), feeling (affective) and acting (psychomotor). It predicts person's scores based on his/her ability, describes and check whether the test/exams administered to students with similar characteristics have similar difficulty, discrimination, guessing and other manifestation of aberrancy (carelessness) level.

This theory, therefore, is particularly relevant to this study because, students with physical disability whose true latent score may be compromised, but owe to the provision made by the different types of parameter models, effects of biases caused by aberrant manifestation in the students' responses to test items can be noticed. The responses will point to the true ability estimate.

## 3. Conceptual Issues

### 3.1 Types Of Physical Disability

These disabilities are disturbances at the level of the organ, which includes defects in and loss of limbs, organ or other body structure (Ghoshal, 2018). This category of disability includes people with different types of physical and observable disorder, including upper or lower limb(s) disability, absence of a body part, polio, visual and auditory disorders, or disability in co-ordination with different organs of the body (Kamal and Hussain, 2019). Short and stunted also fall into this category (Khanal, 2015).

For ease of identification and purpose of placement, two dimensions of physical disability are recognized,

namely; Orthopedic Impairment and Visual Impairment.

#### 3.1.1 Orthopedic Impairment

This condition of impairment is on bones and associated with muscles and joints disorder. Opinion from Squires and Burnell (2018) adds that "the categories of children with this type of challenges are found with withered upper arms and lower arms, crippled or hunchback". They find it difficult or impossible to use legs, arms, or body trunk effectively due to paralysis, stiffness, pain, or other impairments (Lekuta, 2019).

#### 3.1.2 Visual Impairment

A child who has visual disorder may not be able to easily comprehend what is seen and get muscle linked up fast enough to keep pace with others (Haruna, 2017). Hence, completion of academic work will hardly be ever completed by the affected child. Albinism is often associated with visual problems resulting from involuntary eye movement, squinting and astigmatism which are from birth and lifelong, but not progressive (Nwosu, Unachukwu, Nwasor, and Ezennaka, 2019). For their associated visual impairments, Burger (2016) suggested its classification as disabled.

#### 3.1.3 Aberrant Response Behavior/Pattern

A response to examination items that is inconsistent with expectation is said to be aberrant. Item response models don't often take into cognizance true individual response probabilities because of the presence of response disturbance, such as Guessing, Cheating, or Plodding (Hambleton, 2018). Many various possible reasons leading to aberrant response pattern of students have been suggested by Eckerly (2017) as behaviors such as plodding, cheating, guessing, sleeping, alignment errors, test anxiety, creativity among many. For example, "student with low ability may randomly guess correctly on a multiple-choice test item, the test score might be inflated leading to a higher than the actual impression of the respondent" (Hambleton, 2018; Jia et'al, 2019).

##### 3.1.3.1 Guessing

This behavior is from test takers who form an opinion and respond to items on a test from little or no evidence of its correctness by random-picking an answer blindly on medium-to-difficult items.

##### 3.1.3.2 Cheating

This behavior is manifested by usually low ability students that struggle to answer medium-to-difficult items. After futile attempt they resorts to looking off a high-ability neighbor’s answer sheet to respond to the most difficult items on the test/examination.

**3.1.3.3 Plodding**

This occurs when a test taker writes very slowly and methodically, refusing to answer the next item(s) on the test until satisfied that the current item is satisfactorily answered correctly. Plodding test taker may have high ability level, but may not be reflected in the overall score.

**3.1.3.4 Deficiency of Sub-Abilities**

Items with relative difficulty may not align with particular content area in which the examinee has little or no knowledge about. Students with deficiencies in sub-abilities may show some aberrant response behavior.

**4. Students Academic Achievement and Physical Disability Status**

Academic Achievement is the knowledge attained, or skill developed in school subjects, usually determined by test scores which are assigned by the examiner/teacher (Kamal and Hussaini, 2022). In a normal classroom setting where teaching and learning is all inclusive, “both the physically challenged students and non-physically challenged students are expected to carry out learning activities at the same time allotted for the teacher to teach, give classroom assignment and to have equal academic achievement irrespective of their challenges” (Nneka and Dickson, 2017). However, despite the individual characteristic nature, each of these students attends school with their unique nature, potentials and ability to cope with learning task”. Some of them are able to learn and make adjustment with ease, while other learners

The following aberrant behaviours were observed:

**Table 1:** Observed Aberrant Response Behaviors from Students with Physical disability in Public Secondary Schools in Niger State of Nigeria.

Aberrant Responses	A1%	A2%	A3%	A4%	Remark
Guessing	9	5	27	59	NM
Cheating	80	17	2	2	M
Deficiency of sub-abilities	3	2	15	80	NM
Plodding	55	32	9	5	M

**Note:** A1=High; A2=Moderate; A3=Low; A4=Very low NM=Not manifest; M=Manifest

encounter varying degrees of difficulties with related achievement output (Ugoma, 2018).

Children with orthopedic impaired challenges involving the movement skills, or visually impaired with complete or partial visual problem struggle to catch up (Gary and Abang, 2021). But when they are not able to meet up, and neither consideration from their teachers, nor help from fellow students who are non-physically challenged, lack of interest for learning and discouragement may set in, which can also affect academic achievement (Teubert, 2019).

**5. Research Methodology**

The study used a quasi-experimental design among 98 (75 orthopaedic disabled and 23 visual disabled) students with various and varying degrees of physical disabilities purposively selected and discovered from 66 public secondary schools of SSS III in Niger State of Nigeria. The researcher developed two instruments for data collection, namely; Mathematics, English Language Achievement Test (MELAT) for measurement of students’ achievement and ability in compulsory subjects; and a proforma, titled ‘Proforma for Achievement Scores of Students with Physical Disability (PASS-PD) for harvesting test scores/records of Mean Cumulative Academic Achievement (MCAA) - SS II continuous assessment/promotion examination 2022/23 session, Pre-test and Post test MELAT. The subjects have high, average and low ability levels as categorized by the Mean Cumulative Academic Achievement (MCAA) scores. Pre-test (MELAT) was administered in a strictly invigilated separate class, while same subjects were tested again (post-test) using the same instrument (MELAT) but with altered arrangement of items in an inclusive class, after two weeks, with loosed invigilation to observe possible aberrant behaviours and response patterns. Data was analyzed using descriptive statistics of percentages to answer research questions, and Analysis of Variance (ANOVA) to test the hypotheses at the 0.05 level of significance.

Data on Table 1 shows four different types of aberrant response behaviours observed among students, namely: guessing, cheating, deficiency of sub-abilities, and Plodding. Cheating appears to be the most prevalent aberrant response behaviour among the students with 80% and plodding (55%).

## 6. Results

### Answering Research Questions

The results of this study are presented in tables 2 and 3.

**Table 2:** Academic Achievement of Students with Orthopaedic Impairment in Niger State

Performance	MCAA		Pre-Test MELAT		Post-Test MELAT	
	Freq	Percent	Freq	Percent	Freq	Percent
Excellent	7	9	6	8	2	3
Good	14	19	0	0	4	5
Fair	41	55	14	19	41	55
Poor	13	17	55	73	28	37
Total	75	100	75	100	75	100

**NB:** Prevalent Aberrant Response Pattern: (1). Cheating and copying (2). Plodding

Table 2 provides an insightful check of the academic achievement levels of students with orthopaedic impairments. The data reveals that in MCAA 9% fall into the category of excellent, 19% in the category of Good, 55% in Fair and 17% in Poor category. In Pre-test MELAT, 8%, 19% and 73% fall in the categories of Excellent, Fair and Poor, respectively. No representation in the category of Good. In Post-test MELAT, 3%, 5%, 55% and 37% fall in the respective order of Excellent, Good, Fair and Poor.

**Table 3:** Academic Achievement of Students with Visual Impairment in Niger State

Performance	MCAA		Pre-Test MELAT		Post-Test MELAT	
	Freq	Percent	Freq	Percent	Freq	Percent
Excellent	5	22	17	74	7	30
Good	11	48	5	22	16	70
Fair	6	26	0	0	0	0
Poor	1	4	1	4	0	0
Total	23	100	23	100	23	100

**NB:** Prevalent Aberrant Response Pattern: (1). Cheating and copying (2). Plodding

In Table 3 an overview of the academic achievement of students with visual impairments is provided. MCAA results reveals 22% of students attained the coveted "Excellent" performance level. Concurrently, a substantial proportion of 48% demonstrated a "Good" level of performance, while 26% and 4% of students fell within the "Fair" and "Poor" categories, respectively. Pre-test MELAT results unveil a remarkable transformation, with an overwhelming majority of 74% of students ascending to the pinnacle of "Excellent" academic achievement. This seismic shift is further complemented by a contraction of the "Good" performers to 22%, while the "Fair" and "Poor" categories were not represented. Post-test MELAT data exhibits a divergent narrative, with a recalibration of performance levels. Specifically, 30% of students maintained their status within the "Excellent" stratum, while a substantial 70% consolidated their position within the "Good" category. Notably, the "Fair" and "Poor" performers were entirely absent from the post-test results.

### Testing of Hypothesis

The results of this study are presented in tables 4 and 5.

Table 4 below shows the difference in academic achievement levels of students with orthopaedic impairments for MCAA, Pre-test and Post-test MELAT.

**Table 4:** Difference in the Academic Achievements of Students with Orthopaedic Impairment in Niger State

	Type III sum of Squares	DF	Mean Square	F	P	$\eta^2$
Treatment	13638.32	2	6819.16	30.32	<.001	0.42
Residual	49924.03	222	224.88			
Total	63562.354	224				

df = n-1

The results of ANOVA shows that  $F = 30.32$ , and the  $P$ -value =  $<0.001$ . This implies, there is statistical significant difference in the academic achievement of students in MCAA, Pre-test and Post-test MELAT. Hence, the null hypothesis is rejected.

**Table 5:** Difference in the Academic Achievements of Students with Visual Impairment in Niger State

	Type III sum of Squares	DF	Mean Square	F	P	$\eta^2$
Treatment	3752.91	2	1876.45	13.41	<.001	0.39
Residual	9232.17	66	139.88			
Total	12985.08	68				

df = n-1

Table 5 shows the difference in academic achievement levels of students with visual impairments. The results of ANOVA shows that  $F = 13.41$ , and the  $P$ -value =  $<0.001$ . By implication, there is statistical significant difference in the academic achievement of students in MCAA, Pre-test and Post-test MELAT. Therefore, the null hypothesis is not accepted.

### 7. Discussion of Findings

The focus of this study was to assess the influence of aberrant response behavior on academic achievement of secondary school students with physical disability in Niger State public schools. The results of the findings show there is statistical significant difference in the academic achievement of students with orthopaedics and visual impairments in MCAA, Pre-test and Post-test MELAT. Recall that among guessing, cheating, deficiency of sub-abilities, and Plodding as observed aberrant response behaviours among the subjects during the administration of Post-test MELAT, cheating (80%) appears to be the most prevalent followed by plodding (55%). This is in agreement with the findings of Idika, Shogbesan and Ogundakin (2016), who discovered that, the nature of compromise, which can be described as cheating, can produce an inflated score which would essentially be

a misrepresentation of that individual's achievement in test, thus yielding an in-accurate estimate of academic achievement index.

These findings under-scores the obstacles the students encounter in achieving satisfactory academic outcomes, and that despite the challenges, there are individual students with physical disabilities within the group (as in the case of the students with visual impairments) who excel academically, possibly owing to their resilience, effective support structures, or personalized teaching methodologies.

However, a concerning issue emerges regarding the number of visual impaired students classified in the categories of excellent, particularly in the Pre-Test and post-test MELAT, where a significant 74% dropped to 30% despite the prevalent and manifested aberrant behaviours exhibited due to loosed invigilation in post-test MELAT. Students with orthopaedic impairments seems to have utilized the opportunity of the loosed invigilation, but only for a significant 73% to drop to 37% at poor category in pre-test and post-test MELAT respectively. This raises questions about the impact of unsupervised testing conditions on students' academic achievements, suggesting that students with physical disabilities may face challenges

and distractions when responding to test items even with loosed invigilation.

## 8. Conclusion

The results of the study showed a substantial percentage of students with visual impairment achieving excellent and good performance levels in testing conditions. This emphasized the need for tailored educational interventions, effective monitoring and support systems to address the unique challenges faced by these vulnerable students.

## 9. Recommendations

- Comprehensive academic integrity policies, along with educational programs and support systems to promote ethical conduct and address the root causes of aberrant behaviours should be developed and implemented.
- Establish specialized support services, including assistive technologies, and tailored instructional methods to enhance improved learning experiences and valid outcomes of students with orthopaedic and visual impairments.

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## Empowering Equality through Education: Deconstructing Patriarchy in the Social Studies Classroom - Strategies for Gender-Neutral Teaching in Nigeria

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**Abstract.** This paper explores the importance of gender-neutral education by deconstructing patriarchal norms in the classroom. It examines the impact of gender stereotypes on classroom dynamics, academic choices, and career prospects. The study highlights the need for gender-neutral education to cultivate critical thinking, empathy, and a more comprehensive range of career options. Strategies include challenging stereotypes, providing diverse role models, and creating inclusive learning environments. The article also addresses common misconceptions and concerns, highlighting global progress and successful initiatives. Social studies teachers are crucial in shaping inclusive curricula and promoting active engagement in advocating for gender-neutral education.

**Keywords:** Gender-neutral education, Patriarchal norms, Inclusive curriculum, Gender stereotypes, Classroom environment, Social study education, Gender equality

### 1. Introduction

The dominance of men in various societal domains, including politics, business, and education, is known as patriarchy. This system is distinguished by the unequal allocation of resources, opportunities, and power based on gender, with males typically holding leadership positions (Hazarika et al., 2023). This article explores the complex implications of patriarchy, concentrating on how it affects educational institutions. Throughout history, patriarchy has significantly influenced education, influencing both the curriculum's academic matter and its students' interpersonal interactions (Koseoglu et al., 2020). Deeply ingrained gender roles reinforce stereotypes and conventional notions of masculinity and femininity in educational institutions (Hausmann et

al., 2014). These conventions stem from patriarchal views, have restricted people's potential, and impede society's advancement (Semartini et al., 2020).

Patriarchal standards are sneaky, showing up in covert ways that frequently go unreported. These standards govern how students, instructors, and administrators should behave in the educational system, which feeds a cycle of inequity (Braunstein et al., 2014). The subjects deemed appropriate for boys or girls are determined by gender norms, which also shape goals and restrict professional options (Alordiah et al., 2022). For instance, the sciences are frequently related to masculinity, but careers in childcare are associated with femininity. As a result, people are discouraged from pursuing activities that are seen as inconsistent with their given gender roles, which feeds a vicious cycle (Galano et al., 2023).

Additionally, patriarchal norms affect the dynamics in the classroom. Some students may experience uneven involvement and lowered self-esteem due to male students being pushed to be forceful while female students are supposed to be cooperative (Carlsson et al., 2019). Although biased interactions between instructors and pupils may go unnoticed, they nonetheless contribute to treating disadvantaged genders differently and the lack of possibilities for them (Khoumich et al., 2020, Alordiah, 2015).

Adopting gender-neutral education becomes an effective tactic to combat and change patriarchal attitudes in the face of these difficulties. An atmosphere where all students have equal access to education, resources, and opportunities is created via gender-neutral education, which attempts to eradicate gender-based prejudice and stereotyping (Patel, 2014). Gender-neutral techniques aim to establish a just and inclusive learning environment by destroying the

uneven power relations embedded in conventional education (Hazarika et al., 2023). This paper thoroughly explains how patriarchy affects education, the need for gender-neutral education and its numerous benefits, practical strategies for implementing gender-neutral education, potential obstacles and resistance, ways to gauge implementation success and progress, and a global perspective comparing gender-inclusive education policies.

## 2. Patriarchy's Impact on Education

A patriarchal social structure is one in which men predominate in political leadership positions, moral authority, social privilege, and resource control. By preferring the interests and viewpoints of males above those of women and other gender identities, this system tends to reproduce and perpetuate gender-based inequality (Alordiah et al., 2022; Lari et al., 2022). Investigating the historical foundations of patriarchy is crucial to understanding how deeply it affects schooling now. Civilizations have given men and women different duties through the ages, establishing a framework that permeates the field of education. The idea that boys were the only ones who benefited from knowledge and intellectual progress was reinforced in many ancient cultures because education was sometimes only available to boys (Lindner et al., 2022). Due to historical discrimination, male voices have historically been prized over female voices in schools, perpetuating uneven gender relations (Danielescu, 2020).

Stereotypes concerning expected or regarded proper traits, actions, roles, and features for people based on their perceived gender are preconceived and frequently oversimplified views or assumptions (Xiang et al., 2018). Based on whether someone is perceived as masculine, feminine, or not adhering to established gender standards, these stereotypes can influence how society perceives and treats people (Salerno et al., 2019). The way that students interact, behave, and view themselves in educational environments is undoubtedly impacted by gender stereotypes (Xiang et al., 2018). These prejudices influence how teachers anticipate their pupils to behave in the classroom depending on their ascribed genders. For instance, whereas females may be directed toward caring behaviors, boys may be urged to assume leadership responsibilities. These hidden biases are also seen in interactions between teachers and students. Male students may be acknowledged and praised for their efforts, whereas female students' accomplishments may be minimized or ignored (Kovalkova, 2021).

Unaware prejudices displayed by teachers have a significant impact on the experiences of pupils. For instance, research has revealed that lecturers commonly call on male students, allowing them to predominate in-class debates (Yu, 2023). This inadvertent discrimination may result in unequal speaking chances, reinforcing that male students are more intelligent or competent (Igurardottir et al., 2022). Gender stereotypes significantly shape the academic and professional objectives of students. Gender stereotypes frequently apply to specific topics and professional routes, which results in differences in enrolment and achievement (Olsson et al., 2018). For instance, science and math have historically been viewed as more suited to men, discouraging female students from majoring in STEM disciplines. Similarly, due to traditional conceptions of masculinity, males may be discouraged from engaging in arts or literature-related disciplines (Chan et al., 2022).

How gender is portrayed in instructional materials greatly influences how students see themselves and other people. Books, literature, and the media frequently promote gender prejudices, which helps to maintain unfair standards (Guichot-Reina et al., 2023). A skewed self-perception results when children are exposed to instructional materials that primarily highlight one gender while undervaluing others. Due to this lack of representation, students may feel excluded and doubt their ability to pursue particular disciplines or objectives (Meeussen et al., 2022). Students who are female, for instance, can absorb the idea that their voices don't matter as much as those of men. Traditional gender roles continue to exist due to educational resources that reinforce them. These materials normalize a distorted perception of society's roles by continually portraying men as leaders and women as careers (Abdelhay et al., 2015). As a result, students are less inclined to question these standards and can unintentionally uphold them in the future (Comber et al., 2021).

The perniciousness of patriarchal standards also extends to the pervasiveness of harassment and violence against women in educational settings. These actions are frequently rooted in the patriarchal system's toxic masculinity and unequal power dynamics (Hadi, 2018). Patriarchy encourages power disparities that generate an atmosphere conducive to gender-based violence and harassment. In educational settings, male dominance and entitlement, supported by patriarchal standards, can result in verbal, physical, or emotional abuse against oppressed genders. These actions frequently reflect a desire to assert control and uphold imagined hierarchies (Shah, 2021). In

educational settings, gender-based violence and harassment have significant negative repercussions. Such situations might leave students feeling low self-worth, anxious, and depressed. Their emotional health is impaired, making it difficult to concentrate on their schoolwork. Additionally, these encounters may result in absenteeism, harming their general development and academic performance (Merma-Molina et al., 2021; Alordiah, 2020)).

### 3. Gender-Neutral Education

Gender-neutral education, often called gender-inclusive or gender-sensitive education, is a method of instructing and learning that seeks to foster an atmosphere in which pupils of all genders feel respected, appreciated, and included (Guerrero et al., 2023). This method questions conventional gender norms and prejudices and aims to provide all students equal chances and assistance, regardless of gender identification.

A key weapon for eradicating the profoundly rooted patriarchal standards that have long impeded social development is gender-neutral education. Breaking out from these conventions has various advantages beyond the classroom (Hazarika et al., 2023). Critical thinking and creativity amplify when kids are exposed to multiple ideas and experiences. The limitations patriarchal conventions place on the contributions of particular genders are eliminated by gender-neutral education (Whitford et al., 2022). Students are given the freedom to investigate various concepts and points of view, helping create dynamic and creative learning environments. Students who get gender-neutral education develop empathy and respect for others. Students learn to value diversity and develop more genuine connections when an environment that honors each person's unique talents is fostered. The development of healthy relationships based on comprehension and respect is promoted in such an atmosphere, which also aids in dispelling damaging prejudices and biases (Croft et al., 2021).

Both men and women have been constrained in pursuing their professional objectives by historically gendered job choices (Johnson, 2014). These restrictions are contested by gender-neutral education, which broadens the perspectives of all pupils. By encouraging students to study subjects that may have previously been unavailable owing to cultural conventions, gender roles that aren't strictly enforced enable a more inclusive and varied workforce (Meadows et al., 2020). The ability of gender-neutral education to question and subvert deeply rooted assumptions gives it its transformational potential

(Montecinos et al., 2015). Inclusionary environments where all students, regardless of gender identification, feel appreciated and heard are made possible through gender-neutral education. By destroying preconceptions, teachers foster a climate where different ideas are valued, resulting in more engaging classroom discussions and a greater understanding of other points of view (Teelken et al., 2021). Students are freed from the restrictions of traditional gender roles thanks to gender-neutral education. This emancipation allows Individuals to follow their hobbies and passions without feeling constrained by societal norms (Chan, 2022). A more balanced and equitable educational environment is created when boys feel as at ease exploring the arts and literature as girls do pursuing STEM subjects. By providing pupils with a wide range of role models and opportunities, gender-neutral education is essential for broadening their perspectives.

Gender-neutral education breaks down these barriers in sectors historically dominated by one gender. Students are inspired to picture themselves in roles that were previously regarded as unconventional by showcasing successful people of all genders in fields like STEM (Science, Technology, Engineering, and Mathematics) and the humanities, which contributes to a more inclusive professional landscape (Dele-Ajayi et al., 2020). Students who get gender-neutral education are given the skills they need to follow their passions with unflinching tenacity. Students are encouraged to explore their interests without concern for society's criticism or restrictions based on gender stereotypes by supporting an environment that promotes self-expression and personal growth (Chan, 2022).

Academic achievement and student wellbeing are directly impacted by inclusive, gender-neutral education. Traditional educational institutions based on patriarchal ideals can make minority genders feel inadequate and excluded. However, gender-neutral education overcomes these inequalities, which leads to higher engagement and lower dropout rates among these students. Individuals' dedication to study is strengthened when they feel noticed and respected (Merma-Molina et al., 2021). Academic performance depends on a conducive learning environment. An atmosphere where pupils may thrive without meeting social gender norms is fostered via gender-neutral education. This environment enables students to express their thoughts, ask questions, and actively participate in their studies, eventually leading to better academic results (Kollmayer et al., 2020).

## 4. Strategies for Implementing Gender-Neutral Education

### 4.1 Curriculum and Instruction

Promoting gender-neutral education requires the development of an inclusive curriculum. Educators may incorporate different viewpoints by using resources that represent a wide range of genders, races, and backgrounds. This may entail choosing literature, historical accounts, and case studies that emphasize the voices of those who are underrepresented (Rogers et al., 2019). To impart real-world ideas and experiences, educators can also arrange guest lectures or virtual exchanges with people from other backgrounds. Education-related language and examples may unintentionally promote gender stereotypes. A deliberate effort must be made to change language and examples in gender-neutral education to be inclusive (Xiang et al., 2018). This entails eliminating pronouns particular to one gender and adopting gender-neutral language whenever feasible. Additionally, teachers can check textbooks and course materials to ensure that examples and drawings of both genders are evenly balanced (Lewandowski, 2014). Also, assessment items should be structured in a way that they will be gender-bias-free (Alordiah & Agbajor, 2014)

Specific topics have historically been identified with particular genders, which might support gender stereotypes. To promote involvement from all genders, educators must reframe these topics in the context of gender-neutral education. For instance, instead of being linked to gender-specific talents, mathematics might be portrayed as a helpful skill to everyone. This change in thinking may help remove barriers connected to gender in the educational system (Kollmayer et al., 2020).

### 4.2 Classroom Environment

Establishing unambiguous rules that uphold equality and respect is the first step in creating a diverse learning environment in the classroom (Kuchynka et al., 2022). Teachers can establish ground rules that prevent gender prejudice and promote free discussion. Students are given the confidence to express themselves without worrying about being judged when these standards are regularly upheld, promoting a sense of belonging for both genders (Kovaleva et al., 2022).

Gender-neutral education requires equal involvement from all students. To ensure that all students, regardless of gender, have opportunities to contribute,

teachers might employ strategies including random selection, rotating group roles, and peer-led debates (Shah, 2021). This strategy fosters a collaborative and inclusive learning environment, preventing dominating voices from overshadowing others. A proactive approach to addressing and avoiding gender-based harassment is necessary for gender-neutral education (Domínguez-Martínez et al., 2019). Education professionals can put in place anti-bullying initiatives that focus on gender-related concerns. They can encourage conversations on polite conduct, consent, and wholesome relationships. Clear reporting procedures and support systems ensure students feel secure and inspired to report harassment (Lewis et al., 2022).

### 4.3 Teacher Training and Professional Development

Comprehensive gender-sensitive training is the first step in providing educators with the resources to build gender-neutral classrooms. Workshops can address issues, including detecting unconscious biases, analyzing the effects of gender stereotypes, and fostering inclusive language. These programs provide educators with knowledge and methods for fostering environments that challenge patriarchal norms (Wang, 2023).

Unaware prejudices may have an impact on educators' judgments and behaviors. To promote gender-neutral education, continuous work is required to identify and control these prejudices. To become more conscious of their prejudices, educators might engage in reflective activities like journaling or peer conversations (Wang, 2023). They can also use strategies like self-interruption to stop themselves from acting on prejudiced ideas and keep their behaviour in line with gender-neutral ideals. Developing understanding and empathy among pupils depends on open conversations on gender-related issues. Teachers may promote intelligent discussions on gender norms, stereotypes, and equality through planned activities, debates, and role-playing games (Croft et al., 2021).

### 4.4 Parent and Community Involvement

The effectiveness of gender-neutral education depends heavily on parental participation. Educators can organize parent-teacher conferences and seminars promoting inclusive education's value. The efficacy of these tactics can be increased outside of the classroom by providing materials and instructions for promoting gender-neutral attitudes at home (Themane et al., 2019). Schools can collaborate with nonprofit groups

focusing on gender equality to host events, workshops, and awareness-raising initiatives. These collaborations give students, parents, and the community a bigger platform to support gender-neutral education (Kwok., 2018).

A calculated strategy is needed to spread the importance of gender-neutral education. During certain months devoted to gender equality, schools might host awareness initiatives. Panel discussions, movie screenings, and art exhibitions that stress the significance of confronting patriarchal norms and fostering a more inclusive school atmosphere may be a part of these efforts (Chapman et al., 2021).

#### **4.5 Overcoming Challenges and Resistance**

The idea that gender-neutral education compromises cultural values and customs is a common fallacy (Karlidag-Dennis et al., 2020). However, gender-neutral education attempts to create an atmosphere where all genders have equal opportunities rather than eradicating cultural history (Datzberger et al., 2018). Teachers may show how gender-neutral education is consistent with cultural ideals for a just and peaceful society by emphasizing the shared values of respect, empathy, and fairness (Eriksson et al., 2020). Traditional gender norms are questioned by gender-neutral schooling, which some people may view as a danger to the stability of society. Teachers can address this issue by stressing that change is not the same as erasure (Huyge et al., 2015). Educators may promote acceptance and understanding by encouraging open discussion and showing how gender-neutral education can strengthen traditional values via fair participation and mutual respect (Arar, 2014).

The efficiency and advantages of gender-neutral education must be shown to effectively combat resistance, which requires research-based arguments supported by actual data. Many studies demonstrate the benefits of gender-neutral schooling (Shutts et al., 2017). According to studies, kids achieve higher academic standards, have better social connections, and exhibit greater confidence in classrooms that value diversity of viewpoints and equitable participation (Zubiri-Esnaola et al., 2020). To demonstrate the sound effects of gender-neutral education, educators might use specific instances of schools that have successfully adopted it. To debunk misconceptions and biases about gender-neutral education, data-driven techniques are valuable. (Gill et al., 2014). For instance, evidence indicating increased learning results for both genders may be used to dispel the myth that gender-neutral education hurts academic achievement. Additionally, educators may utilize facts

to disprove preconceptions by showing that, given equal chances, people of both genders can succeed in various fields and occupations (Krishna et al., 2020).

#### **5. Measurable Indicators of Gender-Neutral Education's Impact**

It is critical to identify precise success indicators that represent the transformative changes that gender-neutral education wants to bring about to assess this approach's efficacy. Changing students' views and behaviour about gender roles is crucial to success (Griffith et al., 2014). Students' perceptions of their and classmates' talents might alter over time, which can be observed and measured through surveys and observations. Teachers may measure the beneficial effects of gender-neutral education on classroom dynamics by keeping track of the decline in gender stereotypes, the rise in respect for other viewpoints, and the improvement in collaboration among students of all genders (Shutts et al., 2017). Examining test results and grades of students before and after using gender-neutral practices can show benefits for both sexes (Xiang et al., 2018). This can assist in determining whether removing obstacles linked to gender increases engagement, understanding, and general academic success.

The methods used to collect data are essential for obtaining quantitative and qualitative insights on how gender-neutral education is developing.

There are ways to collect qualitative data from kids, parents, and educators through surveys, focus groups, and interviews (Pacheco-Montoya et al., 2022). Structured surveys can measure how students' experiences in the classroom, their perceptions of gender roles, and the effects of gender-neutral tactics have changed. Focus group discussions and interviews enable participants to offer personal experiences and ideas that quantitative data alone might not be able to convey (Sheaffer et al., 2021) fully. Educators can determine if gender-neutral education has resulted in various professional pathways, leadership positions, and general success by tracking students after they complete their academic careers. This information can demonstrate the long-lasting effects of gender-neutral education on students' decisions and successes (Fernández-Cornejo et al., 2016).

#### **6. Conclusion**

Throughout this article, we have examined the many facets of gender-neutral education and how crucial it is in questioning and changing patriarchal attitudes that are deeply embedded in educational institutions.

We looked at the historical background of gender roles in education, how they are still prevalent, and the far-reaching effects of stereotypes, uneven representation, and violence against women. By looking at these concerns, we created the framework for understanding the necessity and importance of adopting gender-neutral education. It is impossible to exaggerate the value of gender-neutral education. It represents an effective way to escape the constraints of patriarchal traditions that have impeded advancement, restricted possibilities, and sustained inequity. Gender-neutral education liberates people of all genders from the limitations imposed by social expectations by questioning established gender roles and establishing an inclusive learning environment. As we come to a close, we must understand our contribution to the cause of gender-neutral education. Recognizing the effects of gender inequality in educational settings and committing to challenging these norms are the first steps in advocating for change. Your voice and actions are essential whether you are a teacher, student, parent, or part of the community. It's time to have dialogue, confront prejudices, and proactively assist programs that advance inclusive and equitable education for everyone. The movement for gender-neutral education envisions a day where respect, empathy, and the free pursuit of knowledge prevail in the classroom. By tearing down patriarchal conventions, we open the door for a generation of students free of sexist expectations, secure in their skills, and prepared to make a real difference in creating a more fair and equitable society. Beyond the classroom, this vision promotes a culture where people are encouraged to question gender norms in all spheres of life, resulting in a more inclusive and peaceful global community.

## 7. Implications of this study to social studies teachers

Teachers of social sciences should pay close attention to the consequences of the study "Deconstructing Patriarchy in the Classroom: Strategies for Gender-Neutral Education." Teachers of social studies significantly impact how pupils see society, history, culture, and the forces that shape these things. The results of this study may have the following effects on social studies teachers:

**Recognizing Historical Gender Norms:** Teachers of social studies can assist students in identifying and critically evaluating past gender norms. Teachers may impart an understanding of how patriarchy has influenced countries through time by teaching about the history of gender roles, disparities, and fights for gender rights. Students can situate contemporary

gender issues within historical narratives thanks to this understanding.

**Challenging Stereotypes:** Social studies programs often include social standards and stereotypes. Teachers can actively combat conventional gender stereotypes that could be present in historical documents or textbooks by using the study's findings. Teachers may enable students to examine and dismantle these prejudices by encouraging dialogue and critical thinking.

**Inclusive Curriculum Design:** Social studies instructors can use the study's recommendations to create a more inclusive curriculum. Teachers may assist students in understanding the contributions made by people of all genders throughout history by including varied voices, viewpoints, and experiences. Student's grasp of the diversity of human cultures and the roles that different genders have played is improved by this method.

**Facilitating Constructive Conversations:** The study emphasises the value of encouraging civil discourse on gender-related issues. Social studies teachers may provide safe environments where students can speak openly about gender conventions, inequality, and current gender concerns. Teachers may ensure that talks are inclusive and fruitful by following the study's recommendations.

**Engaging with Global Perspectives:** Global cultures and communities are frequently studied in social studies. Teachers may help students better grasp how other civilisations deal with gender norms and issues by looking at the worldwide perspectives on gender-neutral education offered in the research. This may aid critical thinking and cross-cultural understanding.

**Promoting Civic Engagement:** The study's call to action is pertinent to the objective of social studies, which is to cultivate accountable and involved citizens. Social studies teachers can motivate their students to actively promote gender-neutral education and oppose patriarchal conventions outside the classroom. The emphasis on civic engagement and social transformation in social studies is consistent with this involvement.

**Using Evidence-Based Approaches:** Social studies teachers might utilise the study's evidence-based solutions to dispel doubt or opposition to gender-neutral education. Teachers may reaffirm the legitimacy and advantages of using gender-neutral practices by providing facts, studies, and examples from throughout the globe.

**Creating Inclusive Learning Environments:** Social studies instructors may build inclusive classroom environments where all students feel valued and respected by implementing the study's recommended classroom environment methods. This strategy encourages constructive debate and lets pupils consider other points of view.

## 8. Recommendations

- Social studies teachers should actively participate in training sessions and seminars for professional development that emphasize gender sensitivity, unconscious biases, and inclusive teaching methods.
- Review and revise the social studies curriculum often to ensure it covers various viewpoints on gender-related topics.
- Encourage students to talk openly and respectfully about gender-related issues in the classroom.
- Include gender-neutral education and opinions from around the world in the curriculum.
- Discuss gender-neutral education with your student's parents and guardians.

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## Artificial Intelligence and Machine Learning in enhancing Science Learning Experiences: Exploring Possibilities and Concerns

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**Abstract.** The advent of Artificial Intelligence and Machine Learning has made remarkable impact in all sectors of human activities. In the field of science education, integrating AI and ML have opened new dimensions for improving learning experiences by offering individualized learning, adaptive feedback, innovative pedagogues and data-driven insights that enable science students and teachers to engage with science content and materials in interactive and personalized ways. AI-tools such as virtual tutors, intelligent simulations, and algorithms analyze students' learning patterns, generate context-specific assistance that deepens conceptual understanding of science concepts and problem-solving skills of students. This paper reviews the benefits AI and ML in fostering inquiry-based learning, creating immersive virtual labs where students can conduct experiments in simulated environments, thus helping to mitigate the challenges often posed by poor equipment in physical science laboratories especially in low economies. It highlights how AI tools can improve accessibility to otherwise complex topics, facilitate effective continuous assessment of students' learning outcome and improve students' motivation to learn science through instant feedback. However, the integration of AI and ML in science education raises some concerns. The issue of privacy, over-dependence on technology, perpetrating educational inequalities due to differentials in access are critical challenges requiring mitigation. Ethical implications of using biased data and inability of AI to enhance critical thinking and creativity compared to human teachers are instructive. A balance in human and technology integration in science education is suggested.

**Keywords:** Artificial intelligence; Machine learning; SCIENCE education; science learning; learning experiences; Educational technology

### 1. Introduction

The rapid advancement of technology has profoundly influenced all landscapes especially education. From traditional classrooms to digital learning environments, technology has emerged as a transformative force, reshaping how humans perceive, impart, acquire, and apply knowledge in virtually all domains (Liando & Tatipang, 2024; Haidir, 2023; Nykyporets et al., 2023; Cheung et al., 2021; Groff, 2013). This evolution has ushered in a new era in education characterized by enhanced accessibility, engagement, and customization (Malik, 2023; Bondac & Hrestic 2023; Crawford, 2017). The growing role of technology in education and technology of education can be observed across various dimensions. Digital tools, ranging from interactive learning platforms to virtual simulations, have become integral components of modern pedagogical approaches (Kiong, 2023; Li, 2023; Haleem et al., 2022; Guaña-Moya et al., 2022; Asad et al., 2021; Makarova & Makarova, 2018). These tools facilitate dynamic and immersive learning experiences that cater to diverse learning styles, engaging students in ways that textbooks and lectures alone cannot achieve. The availability of online resources and open educational materials have democratized education, breaking down geographical barriers and expanding learning opportunities beyond traditional classroom settings. This accessibility is particularly important in bridging educational gaps and promoting lifelong learning, as learners of all ages can access a wealth of information at their own pace and convenience (Luo, 2022; Inegbedion, 2022;

Condruzbaescu, 2020; Nobre, 2020; Faridi & Ebad, 2018; Ritella, 2017). Of note is the impact of collaborative technologies which have transformed the way students interact with peers and educators. Virtual classrooms, discussion forums, and collaborative document editing enable learners to seamlessly communicate and share knowledge, fostering a sense of community in both physical, virtual and even remote learning environments.

The rise of technology in education, however, comes with its set of challenges and considerations. Prominent among these are ensuring equitable access to technology, addressing privacy concerns, and striking a balance between screen time and face-to-face interaction (Joshi, 2023; Jiang, 2023; Castelli, & Sarvary, 2021; Franks, 2020; Anshari, et al., 2017). These are complex issues educators and policymakers often encounter and grapple with while using technology in the field of science education. In harnessing the beneficial qualities of integrating technology in education, science educators need to critically understand and empower learners to thrive in an increasingly digital world.

The science education domain is undergoing a profound transformation with the integration of cutting-edge technologies as in industries and human interaction. Their application within the realm of science education opens up new dimension for enhancing learning experiences, comprehension of complex concepts, and overall engagement among science learners (Rahmat, et al., 2023; Patero, 2023; Struyf et al., 2019). Such technological frontier that are currently redefining science teaching and learning are Artificial Intelligence (AI) and Machine Learning (ML). AI and ML, once confined to the realm of science fiction, have swiftly become tangible realities, ingrained in our daily lives through virtual assistants, recommendation systems, and autonomous vehicles (Bilow, 2020). Within the context of education, they offer a gateway to personalized, dynamic, and immersive learning experiences that are tailored to the individual needs and preferences of students. In science education, where abstract and intricate concepts often pose challenges to traditional pedagogical methods, the integration of AI and ML offers a novel approach to bridging comprehension gaps.

The role of AI in facilitating a customized learning journey that ensures no student is left behind by adapting to the pace and style of individual learners has been acknowledged (Aggarwal et al., 2023; Jian, 2023). Also, the utilization of AI-powered simulations and virtual workrooms and laboratories brings intricate scientific phenomena to life, enabling students to experiment, explore, and learn through

hands-on experiences that were once confined to physical laboratories. This augmentation of learning encounters has the potential to transcend the limitations of physical resources and logistical constraints.

However, as with any transformative advancement, the integration of AI and ML in science education comes with certain complexities and considerations which if not professionally mitigated may hamper the efficacious benefits of the innovation. Ethical concerns, such as data privacy and algorithmic bias require meticulous attention to ensure equitable and fair learning opportunities for all students. The fine balance between human interaction and technological assistance must be carefully navigated to avoid diminishing the critical thinking skills that is at the heart of scientific inquiry and scientific reasoning.

The aim of this paper is to illuminate the potential of AI and ML as catalysts for a re-imagined, enhanced, and more inclusive science education landscape. The scope of this paper is to provide a thorough analysis of the multifaceted aspects surrounding the use of AI and ML in science education. It seeks to provide educators, policymakers, researchers, and stakeholders with a holistic view of the subject matter by addressing the key areas.

Historical antecedents of AI and ML.

Holmes and Tuomi (2022) in a review of the historical development of AI amid claims and counter claims of its genesis, traced its precursors to Polya's (1945) *how to solve it* in which different heuristics for problem solving were presented with the aim of decreasing or shortening the pathway from a problem to its known solution. Further works by E. L Thorndike who in his *law of effect*, Nowell and Simon's *thinking machine*, Pressey's first mechanized multiple choice machine and B. F Skinner's behaviourism were earlier attempts at automating learning via machines. Further development of these earlier ideas resulted in the first Self-adaptive key board instructor (SAKI) a teaching machine developed by Pask and the SCHOLAR put forward by Carbonell in 1970 (see Holmes & Tuomi, 2022 for details). These initial ideas provided the basis for improving learning and teaching as well as provide structured aids to how individuals can solve problems with relative ease.

It is thus of importance to note that due to this many decades of development of the ideas in this field of research, AI and ML are often conceptualized as a field of research in learning rather than a specific machine or tool.

## 2. Concept of Artificial intelligence (AI) and Machine learning (ML)

Artificial intelligence (AI) refers to the simulation of human intelligence processes by machines, especially computer systems. Morandín-Ahuerma (2022) sees Artificial intelligence as the ability of a machine or computer system to simulate and perform tasks that require human intelligence, such as logical reasoning (using rules to reach approximate or definite conclusions), learning (the acquisition of information and rules for using the information), and problem solving, reasoning, perception and language understanding. In the same light, Arunagiri & Sumana (2023), Dave & Kavathiya (2023) and Galbusera et al., (2019) have variously noted that AI consists of a variety of techniques and approaches, including machine learning (where machines learn from data), natural language processing (enabling computers to understand and generate human language), computer vision (enabling computers to interpret visual information), and robotics (creating machines capable of performing tasks in the physical world). AI aims to create systems that can perform tasks that would typically require human intelligence. UNICEF, (2021) in what looks like a holistic consideration conceptualized AI as “machine-based systems that can, given a set of human-defined objectives, make predictions, recommendations, or decisions that influence real or virtual environments” (p. 16). this definition captures the essence of AI in education and science education in particular.

Machine learning (ML) as explained by Dhanalaxmi (2020) as a subset of artificial intelligence (AI) with capacity to develop algorithms and statistical models with which computers systems can execute tasks without definitive instructions but only relying on patterns and inference. This view about the meaning of ML is also expressed by Kawahara (2020) and Shameer et al. (2018). In other words, machine learning allows computers to learn from available data and improve over time without being programmed for every task. Ray (2019) listed several types of machine learning approaches, including:

- Supervised learning which refers to training the algorithm using labeled data pairs where each input has an output label attached to it to help the algorithm learn how to associate inputs with outputs and then enable it to predict or make decisions based on learned associations.
- Unsupervised learning which entails training algorithms with data to uncover hidden patterns or structures in the information

provided. These include clustering and dimensional reduction.

- Reinforcement learning which is a form of machine learning in which an agent learns to make decisions by engaging with its surroundings and receiving feedback through rewards or penalties depending on its actions, with the aim of increasing reward over time.

## 3. Science Education domain

Science education is an academic area that studies of how people learn and understand scientific concepts, principles, and practices. It involves both the theory and practice of designing science curriculum and materials, developing science curriculum contents, pedagogues for science curriculum implementation, strategies and issues in science learning as well as developing assessment strategies for science learning outcomes. The discipline provides practitioners knowledge and competencies to

- Understand the core concepts and principles across scientific disciplines such as biology, chemistry, physics, and allied areas thereby harnessing their areas of relationship to build strategies for deeper understanding of their interconnections. This knowledge forms the foundation for effective teaching, communication and collaborations in science education research.
- develop and nurture pedagogical content knowledge, which involves understanding how to teach specific science concepts effectively and addressing common misconceptions often associated with science learning, and methods for engaging students in scientific inquiry.
- draw on principles of educational psychology such as learning theories, theories of motivation and theories of cognitive development to understand how students learn science and to develop instructional approaches that accommodate diverse learning styles and cognitive abilities.
- design and develop science curricula that inclusive, selecting appropriate content for diverse groups, sequencing such concepts, and integrating cross-cutting themes such as scientific inquiry, critical thinking, and science, technology, engineering, and Mathematics into everyday science learning.
- develop and implement assessment strategies and techniques for evaluating students' understanding of scientific concepts and their ability to reason scientifically while as well as using assessment data to make

instructional decisions that improve science teaching practice.

- engage in continuous professional development such as workshops, conferences, and collaborative research projects to keep practitioners abreast of advances in both science content, pedagogy and educational research trends.

#### 4. AI and ML in Science Education

The pervasive incursion of AI and ML has multifarious impact in the field of science education as in other areas of learning. Notable among them are:

1. In the domain of science education, AI and ML have transformed the way students learn and interact with scientific concepts, offering personalized learning and providing for individual students according to learning needs, progress, and preferences (Oancea et al., 2023). This is achieved by using AI and ML algorithms to analyze large amounts of educational data on students' performance, engagement, and learning history (Patero, 2023; Struyf et al., 2019). Such huge databases are leveraged on by educational platforms to create adaptive learning pathways that adjust in real-time based on each student's progress and comprehension level.

Related to the above is the ability to providing tailored content delivery pathways to suit every student's unique learning style and pace which oftentimes is of advantage to science education content implementation (Tenon, & Epler, 2020; Asaad, 2017). AI and ML technologies assists science educators creating and delivering contents in a manner that resonates with individual students. AI systems can craft content delivery methods that align with how each student learns best from available students' data in such a way that visual learners receive contents enhanced with visual aids and interactive simulations, while contents for auditory learners is fortifies with audio explanations thus fostering understanding and engagement with learning materials. It also takes into account students' interests and real-world applications of scientific knowledge, creating a more meaningful learning experience, a sense of empowerment and enthusiasm and enhanced learning outcome (Aditi, 2022).

2. The integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies into field of science education has ushered in a new era of experiential learning through real-world simulation previously confined to physical laboratories and field studies. Also, AI and ML-powered virtual laboratories now offers students access to experiments that might

be too expensive, logistically challenging, or even hazardous in real-life physical laboratory settings with minimal safety concerns. With AI and ML technologies, students of chemistry, biology, physics and engineering can now manipulate variables, observe reactions, and collect data just as they would in physical laboratories and workshops thus enhancing their understanding of scientific principles and practical skills (Abill et al., 2024). The advent of AI-powered animations, 3D visualizations, and interactive models now enables students to explore concepts that are otherwise difficult to grasp. Concepts like molecular interactions, planetary orbits, and cellular processes can now be visualized making them tangible, comprehensible thus fostering curiosity, engagement and deeper connection to the subject matter (Dede et al., 1997).

3. Science deals with and generates huge data from experiments and research. AI and ML have become useful in managing, processing and analyzing such large data with relative ease and accuracy (Linn, 2003) using their pattern recognition and predictive modeling features. These features enable AI go through huge datasets and identify relationships, correlations, trends, and outliers that ordinary analogue human analysis cannot achieve. This analytical prowess enables science educators and students to undertake deep exploration of scientific phenomena, gain exposure to real-world data analysis scenarios, as well as equip them with skills that extend beyond the classroom.

Apart from analyzing data, AI and ML technologies enable more visually engaging and informative representations of complex datasets in form of graphs, charts, heatmaps, and interactive models that enable science students, teacher and researchers develop intuitive ways to comprehend intricate data. Visual representations are powerful tools for communicating abstract concepts, making it easier for students to grasp complex scientific ideas (Partarakis & Zabulis (2024), identify changing trends such as in climate data, decipher progression in studies of biological processes, or the interactions within complex chemical systems. Translating data into visual forms, help science educators to bridge the gap between theory and practice, empowering students to interact with data and draw meaningful conclusions. AI-driven data analysis and visualization are also important in nurturing skills that are valuable in the modern technology and science education workplace environments (Hohman, et al., 2019) offering a paradigm shift in how data is harnessed for educational purposes. As AI advance, so too does its potential to transform the learning journey of science

educators into a dynamic, data-driven exploration of the natural world.

4. The role of Artificial Intelligence (AI) and Machine Learning (ML) technologies in generating instant feedback and assessment hold great consequences for effective evaluation of science learning outcomes. Delays in feedback from assignment and tests are often overcome when AI and ML technologies are applied into performance studies thus leading to more effective assessment capabilities González-Calatayud, et al., 2021). Educational platforms utilizing AI are able to evaluate student responses in real time and provide quick feedback on science quizzes, assignments, and interactive exercises (Yu, 2024; Kamalov et al., 2023; Chen et al, 2020; Abang et al., 2023; Owan et al., 2023) thus creating a rapid response feedback loop enabling students to gauge their understandings of scientific concepts. In addition, AI can analyze patterns in student performance over time, identifying areas of strength and weakness, providing Science educators needed information on how best to tailor instruction based on individual needs, offering targeted interventions to support struggling students and challenges to those who excel (Bagunaid et al., 2022).

5. Students can analyse their progress, engage in self-assessment of their learning journey, and highlight areas that need additional research with the use of AI-supported platforms (Bagunaid et al., 2022; Owan et al., 2023). Self-assessment findings frequently help and excite students because they foster a growth mindset—a mindset that views barriers as chances for improvement rather than as a means of achieving one’s goals—and boost self-awareness. Moreover, based on a student’s performance, AI and ML technologies can provide extra materials or exercises. The platform can provide extra resources or practice tasks that are customized for each learner in case they are having trouble with a particular idea. With the help of this individualized coaching, students can fix their shortcomings and and reinforce their understanding of scientific principles

### 5. Issues and Considerations of AI and ML use in science Teaching

Despite the many advantages of AI and ML in science education, Zhai et al. (2021) found certain difficulties with their application in science teaching and learning after reviewing the literature over a ten-year period. Common knowledge, best practices, students' knowledge, and attitudes towards AI and ML opportunities and problems are only a few of the difficulties that Kuleto et al. (2021) mentioned in their

list of difficulties integrating AI and ML in higher education.

Moral Issues. There are several ethical issues that come up when the use of AI and ML technologies in science teaching becomes more widespread. Although these technologies have revolutionary potential, they also bring up difficult problems that require serious consideration and deliberate responses (Zhai et al., 2021; Rizvi et al., 2021)

### 5.1 Protecting student information and maintaining data privacy.

For AI and ML to work properly, data is required, and this data frequently consists of learning patterns, personal information, and student performance statistics. Security and privacy issues are raised by the gathering and use of such data. Comprehensive safety protocols must be in place to protect student data from misuse, illicit access, and breaches at educational institutions and technology providers. Safeguarding the integrity of the educational experience and preserving student trust requires strict adherence to data privacy standards and transparency in data gathering processes. A difficult balance must be struck between the requirement for data-driven insights and the necessity to safeguard students' sensitive information. To lessen the dangers related to data privacy, comprehensive privacy rules, open data handling procedures, and unambiguous permission procedures are crucial.

AI algorithms may contain bias and may reinforce preexisting inequities. When AI algorithms learn from past data, biases in that data may unintentionally be encoded. Biased algorithms have the potential to maintain differences in learning results in the context of science education, especially if they unintentionally benefit some groups while systematically harming others. This keeps marginalized communities under-represented in STEM disciplines and maintains already-existing educational disparities. It takes careful observation, ongoing improvement, and varied representation in the development process to address bias in AI algorithms. Together, educators and technologists must recognize and address prejudices to guarantee that AI-powered learning resources are inclusive and egalitarian. This makes it possible for the education community to actively battle bias, promote a culture of responsibility and openness, and create a more

*Technological Barriers:* In order to ensure fair and efficient implementation, a number of technological issues posed by the integration of AI and ML technologies in science education must be addressed

(Hwang et al., 2020). Among these technological obstacles are

**Fairness and Availability of AI-Powered Resources.** AI and ML technologies have great potential for science education, but only if they are available to all students. Regrettably, not all areas, socioeconomic backgrounds, and educational institutions have equal access to technology, particularly in developing nations. Inequalities in education could be made worse if certain students are unable to access resources driven by artificial intelligence. Initiatives aimed at closing the digital divide must be given top priority by educators and policymakers. This could entail giving cloud-based solutions that are more accessible even with restricted hardware, guaranteeing internet connectivity in under-served areas, or subsidizing technology. Ensuring that learning experiences enhanced by AI and ML are inclusive and accessible to all is crucial.

To effectively utilize and realize the benefits of AI and ML in science education, regular and continual energy availability is necessary for powering learning tools and equipment. The high expense and unreliability of epileptic energy supplies may prevent the many advantages of AI technology from being fully realized.

**Training Teachers for the Successful Integration of AI Tools.** In order to successfully incorporate AI and ML into scientific education, teachers must be equipped with the skills and knowledge needed to make the most of these technologies. It is difficult to give scientific instructors thorough training since it takes money, time, and a dedication to continuous professional growth. In addition to teaching teachers how to use AI technologies technically, teacher preparation programs should also teach them how to seamlessly integrate these tools into science curricula. Teachers need to know how to analyse AI-generated insights, match learning objectives with AI-powered resources, and make sure that technology complements human intervention in science teaching rather than takes its place.

**Diminished Human Communication.** Although there are many advantages to integrating AI and ML, there is worry that this could lessen the importance of human engagement in the learning process. Interactions among science students, instructors, peers, and mentors support the development of social skills, critical thinking, and holistic growth. Through these exchanges, students are able to clarify issues, pose queries, participate in discussions, and get one-on-one help that goes beyond automated answers. If AI is used excessively for assessment and content delivery, these important facets of education may unintentionally suffer. Therefore, in order to establish an ecosystem where AI augments rather than replaces the crucial human parts of education, scientific

educators must find a balance between AI-driven technologies and the demands of their students for human connection. While science educators concentrate on encouraging discussions, directing inquiry, and mentoring students, AI can act as a facilitator, offering customized content and real-time feedback by carefully designing learning experiences that weave AI and ML technologies into the fabric of collaborative and communicative environments, resulting in the development of an educational environment that maximizes technical breakthroughs while preserving the richness of human connection.

***Influence On The Development Of Communication and Teamwork Skills.*** Proper integration of AI and ML technologies into science education has the potential to change not just how students study, but also how they interact and communicate with one another. While there are many advantages of AI, there are also worries about how it may affect communication and collaboration abilities, which are critical for both professional and personal development in science domains (Moemeke, 2023). Students participate in group discussions, peer-to-peer exchanges, and cooperative projects in traditional learning environments. These encounters promote the growth of empathy, interpersonal skills, and the capacity to collaborate well in a variety of teams. However, there are concerns that if AI-powered personalized learning gains traction, students will engage with technology more than their classmates. The fact that scientific knowledge is negotiated by a professional community of scientists, educators, and researchers through cooperation, communication, and the refining of viewpoints, exacerbates this worry. Science educators and AI/ML-powered tools need to work together to purposefully include cooperative activities into science-based learning experiences. Students can practise effective communication and the art of teamwork through group projects, debates, and interactive problem-solving exercises. A careful incorporation of AI-powered resources into these kinds of cooperative environments, will enable science educators create a balance between individualized instruction and the development of social skills.

***Over-reliance on AI.*** While AI and ML technologies hold the promise of enhancing teaching and learning, there lie a notable concern regarding the potential over-reliance on these tools. As students become accustomed to instant answers and guided learning pathways, the risk that their critical thinking and problem-solving skills might diminish increases as well (Gligorea et al., 2023; Kuleto et al., 2021). Relying solely on AI to provide solutions can hinder students from grappling with complex concepts independently and from developing the analytical skills needed for lifelong learning. In mitigating this

challenge, science educators and practitioners must actively encourage a blended approach that combines AI-driven resources with traditional problem-solving methodologies. Encouraging students to explore solutions independently, engage in open-ended inquiries, and devise strategies to solve unfamiliar problems is essential. AI can serve as a valuable resource, offering insights and guidance, but educators must create learning experiences that foster curiosity, experimentation, and resilience in the face of challenges. It should be noted that one of the factors that enhance enquiry is when a scientist arrives at some questions that are unanswered by a known formula, this triggers further questions and actions and oftentimes result in breakthroughs.

Furthermore, educators need to foster a culture that celebrates curiosity, intellectual exploration, and the value of not knowing all the answers. Promoting growth mindset and encouraging students to push the boundaries of their knowledge, ensures that AI's role remains complementary rather than inhibitory to the development of critical thinking and problem-solving skills and scientific research development.

The integration of AI and ML technologies in science education necessitates a mindful approach to the preservation of collaborative and communication skills, as well as the cultivation of critical thinking and problem-solving abilities. Designing learning experiences that strike a harmonious balance between AI-driven assistance and the fostering of core competencies, enhance the harness of the benefits of technology while nurturing the holistic growth of students.

#### AI and ML-powered educational platforms

There are innovative AI and ML-technology powered educational platforms that have transformed the ways students learn and educators teach science-based disciplines. Some of them are here highlighted.

2. Smart Sparrow (<https://www.smartsparrow.com/>) is an AI-powered platform that offers adaptive e-Learning solutions. It allows educators to design interactive, data-rich lessons that for real-time to students' responses. The platform provides instant feedback and guidance, fostering engagement and improving learning outcomes. Smart Sparrow's case studies have shown improved retention rates and deeper conceptual understanding across various subjects. Hu, (2021) reported notable improvements in learning outcomes when Smart Sparrow was implemented in university science courses. Students who used the platform showed higher levels of mastery in course content compared to those in traditional lecture-based classes. The adaptive nature of Smart Sparrow allowed students to focus on areas where they needed more support, leading to improved retention and comprehension.

3. DreamBox Learning, an AI-driven math program designed to adapt to each student's learning pace and style. Its algorithms continuously analyze student interactions to offer personalized lessons that cater to their strengths and weaknesses. The platform encourages exploration and problem-solving, aligning with students' individual abilities and ensuring a deeper understanding of mathematical concepts. Dabingaya (2022) and Chen (2019) reported that students using DreamBox consistently outperformed their peers on standardized math assessments. The program's adaptive nature allowed students to progress at their own pace, resulting in deeper conceptual understanding and higher achievement scores.

4. Coursera, a leading online learning platform that employs AI to enhance student engagement and retention analyzes data on course interactions, completion rates, and assessment performance, as well as offers recommendations to students on how to succeed in their chosen courses. The inherent AI-powered peer reviews and instant feedback mechanisms also contribute to a more interactive and effective learning experience. Ayo (2023) and Salam et al., (2023) reported that Coursera enhanced student engagement and improved learning outcomes through data-driven recommendations and that students who followed Coursera's personalized study plans generated through AI analysis of their interactions, demonstrated higher completion rates and more consistent engagement with course content.

5. Labster, a platform that offers virtual laboratory simulations that enable students to conduct experiments in a risk-free digital environment. The platform employs AI to provide instant feedback, guide students through experiments, and simulate complex scientific phenomena (Acero, 2023). Labster's immersive simulations help bridge the gap between theory and practice, enhancing students' practical understanding of scientific concepts though Dyrberg et al., (2017) earlier reported no difference in student motivation.

6. Gradescope is an AI-assisted grading platform used in secondary and higher education institutions. It streamlines the grading process for assignments and exams, utilizing ML to recognize and categorize different answer formats. Educators can provide feedback more efficiently, and students receive detailed feedback faster. Gradescope enhances the grading experience for both educators and learners, allowing more time for instructional interactions.

Sana Labs is an AI-powered platform that transforms higher education by offering personalized learning experiences. It analyzes individual learning patterns and preferences to curate course content that matches students' needs. Sana Labs' case studies demonstrate improved learning outcomes, increased engagement,

and higher completion rates for university courses. The platform empowers students to take ownership of their learning journey, enhancing their understanding of complex subjects.

Carnegie Learning Carnegie Learning offers AI-driven math curricula spanning from elementary to higher education. The platform personalizes lessons and assessments based on each student's strengths and areas requiring improvement. It employs AI-generated hints and solutions to guide students through problem-solving processes. Carnegie Learning's data-driven approach improves students' math proficiency and instills problem-solving skills across educational levels.

## **6. Recommendations for Effective AI and ML Integration into Science Education Delivery**

### **Training and Professional Development**

To ensure the successful integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies in science education, a comprehensive approach to training and professional development is essential. Educators and stakeholders need to be equipped with the necessary knowledge and skills to harness the full potential of these technologies. This can be achieved by establishing training programs that empower science educators with the technical expertise needed to effectively integrate AI and ML technologies into their teaching practices. Workshops, webinars, and online courses can offer insights into the capabilities and limitations of AI tools, allowing educators to make informed decisions about their use in the classroom.

complementing technical training with pedagogical guidance on how to design curriculum and learning experiences that leverage AI-driven tools. Science educators should be trained in creating engaging content, designing activities that promote critical thinking, and effectively blending AI assistance with human guidance to enhance learning outcomes.

collaborating with EdTech experts who specialize in AI and ML integration. These experts can offer insights into best practices, share case studies, and provide guidance on selecting appropriate tools that align with educational goals.

fostering peer learning communities where educators can share experiences, insights, and challenges related to AI integration. Collaborative spaces provide opportunities to exchange ideas, troubleshoot issues, and collectively develop strategies for effective implementation.

providing incentives for professional growth to science educators to engage in continuous professional

development related to AI and ML technologies and reward educators who actively seek to enhance their skills in integrating technology, thereby creating a culture of lifelong learning and innovation.

offering institutional support for training initiatives such as allocating resources for training programs, providing access to technology infrastructure, and integrating AI-focused training into broader professional development frameworks.

7. involving students in the process of integrating AI and ML technologies can provide insights into how these tools resonate with their learning styles and preferences thus provide feedback that can guide refinements and improvements in the implementation process.

8. Providing Teachers with the Necessary Skills to Effectively Use AI and ML Tools. As the integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies in science education gains prominence, it is imperative to empower educators with the skills to navigate these tools adeptly. This involves a comprehensive approach to training that enables teachers to harness the potential of AI and ML for enriched learning experiences through targeted workshops and courses designed specifically and tailored to educators, focusing on the practical application of AI and ML tools in science education; hands-on experience that provide educators with hands-on experience in using AI and ML tools; peer coaching that encourage science educators who have successfully integrated AI and ML tools to serve as peer coaches. These coaches can guide their colleagues through the process, offering insights, troubleshooting assistance, and sharing best practices.

9. Continuous Learning to Keep Up with Evolving Technology. The field of AI and ML is rapidly evolving, and educators must embrace a mindset of continuous learning to stay abreast of advancements. AI-powered tools and techniques are constantly improving, and STEM educators need to adapt to fully leverage their potential.

10. Foster a culture of continuous learning within educational institutions. Encourage educators to engage in regular upskilling and professional development opportunities related to AI and ML.

11. Access to Resources: Provide educators with access to a repository of resources, including articles, webinars, online courses, and research papers, to keep them informed about the latest developments in AI and ML technologies.

12. establish channels for educators to receive updates on AI and ML trends, breakthroughs, and emerging tools. Regular communication ensures that educators are aware of new possibilities and can integrate them into their teaching practices.

13. collaborating with AI and tech industry professionals to facilitate technology updates and insights directly from experts. Industry partnerships can offer educators practical insights into the applications and implications of cutting-edge AI technologies.

#### **Ensuring equity in access to AI and ML infrastructure**

As AI and Machine Learning (ML) technologies become integral to science education, it is crucial to ensure equitable access to these resources, irrespective of students' backgrounds or circumstances. Prioritizing inclusiveness in educational institutions can minimize disparities in access and create a level playing field for all learners. This can be achieved by

- investing in technology infrastructure to bridge the digital divide by individuals, interest groups and IT professionals. This ensures that students from all socioeconomic backgrounds have access to devices and reliable internet connections required for utilizing AI-powered resources.
- adopting cloud-based platforms for AI integration. Cloud solutions minimize hardware requirements, making AI resources more accessible on a wider range of devices, including low-end devices that students might possess.
- developing offline or hybrid models that allow science students to access AI resources even in low-connectivity areas. This ensures that learners in remote or under-served locations can also benefit from AI-driven educational tools.

#### **Mitigating Potential Bias and Discrimination in AI Algorithms**

AI algorithms can inadvertently perpetuate biases present in historical data, potentially leading to discriminatory outcomes. To ensure equity in AI integration, educational institutions must

- use diverse and representative datasets during the development of AI algorithms to ensure that the data used for training is inclusive and encompasses various demographic groups, thereby minimizing the risk of reinforcing biases.
- undertake periodic audit of AI algorithms to identify and rectify biases that might emerge over time and implement mechanisms to detect and correct instances where algorithms produce unequal or biased outcomes.
- foster transparency in AI implementation by providing information on how algorithms make decisions so as to offer explanation on the logic behind AI-generated recommendations and ensure students and educators understand the basis for the insights provided.
- put in place ethics committees or guidelines for AI integration in science education. These provide oversight and review the ethical implications of AI-

powered tools, ensuring that they align with educational values and principles.

- integrate educational modules that address algorithmic bias into curricula and educate students about the ethical concerns associated with AI and empower them to critically evaluate AI-generated information.

#### **Balancing AI and Human Interaction**

##### **1. Guidelines for Maintaining a Healthy Balance Between AI Assistance and Human Guidance**

The successful integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies in science education hinges on finding the right balance between technology-driven assistance and human interaction. This equilibrium ensures that AI enhances, rather than replaces, the essential role of educators and human connections. Achieving this requires

- developing guidelines that emphasize the alignment of AI tools with educational goals. AI should complement instructional objectives rather than dominate them. Encourage educators to integrate AI in ways that enhance learning experiences and foster meaningful engagement.
- establish thresholds for AI involvement in different aspects of education. Determine when AI-generated insights should be supplemented by human input, such as facilitating discussions, providing context, and addressing students' emotional needs.
- promote a mix of individualized learning through AI and collaborative learning through human interactions. This encourages students to engage in group discussions, peer evaluations, and collaborative projects that foster teamwork and communication skills.

##### **2. Fostering Critical Thinking and Problem-Solving Alongside AI-Driven Learning**

While AI can offer valuable insights, it is of essence to cultivate students' critical thinking and problem-solving skills alongside the use of AI tools. Nurturing these competencies ensures that students are well-equipped to navigate complex challenges independently.

- design assignments and projects that require students to think critically and solve problems without direct AI assistance. Encourage students to analyze, synthesize, and evaluate information from multiple sources to arrive at well-informed conclusions.
- encourage students to question and critically evaluate AI-generated insights. Students should be taught how to assess the reliability of AI recommendations, identify potential biases, and verify information through independent research.
- integrate real-world scenarios and challenges that demand creative problem-solving by encouraging science students to apply their knowledge to practical

situations, considering diverse perspectives and potential solutions.

- engage students to question issues (Socratic dialogues) that stimulate critical thinking by encouraging them to explore complex questions, articulate their reasoning, and engage in open discussions that foster intellectual growth.

#### **Increasing Human Interaction**

As AI and Machine Learning (ML) technologies revolutionize science education, it is vital to strike a delicate balance between leveraging technological advancements and preserving the essential role of face-to-face interactions. Human connections play a crucial role in holistic learning, and science educators and their students should ensure that technology enhances, rather than supplants, these interactions.

- designing, implementing and engaging in structured classroom discussions that encourage students to engage with peers and educators on meaningful topics. These interactions can foster critical thinking, collaboration, and a sense of community involvement.

- Implement hybrid learning models that combine AI-driven individualized learning with regular in-person interactions. This approach allows students to benefit from technology while still participating in group discussions, debates, and hands-on activities.

- create blended learning environments that integrate online and offline interactions. This is to encourage students to use AI for content consumption and practice, while reserving in-person interactions for deep discussions, collaborative projects, and experiential learning.

#### **Impact of AI and ML on Collaborative and Communication Skills**

The integration of AI and ML technologies brings unprecedented opportunities for learning, but science educators must be attentive to their potential impact on collaborative and communication skills. These skills remain crucial for success in various aspects of life and science learning, and AI should be harnessed to enhance, rather than overshadow, their development.

- design assignments that require teamwork, where students must collaborate, brainstorm, and collectively solve problems. This approach holds the potential to reinforce collaboration and cultivate communication skills, showing students the value of working together.

- encourage interdisciplinary projects that demand collaboration between students with different backgrounds. These projects often encourage students to communicate effectively across diverse perspectives and contribute their expertise to achieving shared goal.

#### **Future of AI and ML in science Education development**

The integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies in science

education holds the promise of transforming and reshaping the way students learn and educators teach science. Looking ahead,

1. AI-driven tools will become increasingly proficient at tailoring learning experiences to individual students' needs, preferences, and learning paces. Advances in AI algorithms are likely to generate hyper-personalized learning pathways that adjust content and challenges in real time to optimize engagement and comprehension of science concepts.

2. AI-powered virtual laboratories will provide immersive and realistic hands-on experiences for students, allowing them to conduct experiments, explore scientific phenomena, and analyze data in a risk-free digital environment thus bridging the gap between theoretical knowledge and practical application as well as enable students grasp complex concepts with greater ease.

3. AR and VR technologies, combined with AI, will enable students to interact with three-dimensional models of molecules, ecosystems, and other scientific concepts. These technologies will offer students a deeper understanding by allowing them to manipulate and explore complex structures in a highly engaging and interactive manner.

4. AI will continue to provide science educators with actionable insights by analyzing student performance data. This enable science educators a more precise way to identify areas of struggle, strengths, and learning trends, allowing them to personalize instruction, provide timely interventions, and adapt their teaching strategies to meet students' diverse needs.

5. AI tools will be incorporated into curricula to teach ethical considerations related to AI use, algorithmic bias, and data privacy thus emphasizing critical thinking by prompting students to analyze AI-generated content, assess its reliability, and develop a nuanced understanding of the role of technology in society.

7. AI and ML technologies will extend their reach beyond formal education, acting as lifelong learning companions. Individuals of all ages will access personalized learning resources, skill-building modules, and AI-assisted learning experiences to continuously develop their knowledge and expertise.

### **7. Summary and Conclusions**

The integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies in science education represents a transformative leap forward in the way students learn and educators teach. Throughout this position paper, we have explored the multifaceted landscape of the roles of AI and ML in science education, delving into its benefits, challenges, and recommendations for effective integration.

We began by examining the potential benefits of AI and ML in science education, highlighting how these technologies enhance personalization by adapting learning pathways and content delivery to individual students. We explored how real-world simulations and data analysis visualizations offer experiential and comprehensive learning experiences, expanding students' practical understanding of complex scientific concepts. The paper then delved into the instant feedback and assessment capabilities of AI, emphasizing the value of immediate assessment for student performance and the opportunities for self-improvement that AI-driven tools provide. Additionally, we addressed the ethical concerns surrounding AI and ML, focusing on the need to safeguard data privacy, mitigate algorithmic bias, and ensure equitable access to resources. Issues such as technological barriers and potential loss of human interaction were discussed, emphasizing the importance of equitable access to AI-powered resources and providing training for educators to effectively integrate these tools. Furthermore, we addressed the potential impact on collaborative and communication skills, highlighting the significance of nurturing these competencies alongside AI-driven learning in science students. We forecast a future science education landscape rich with hyper-personalized learning, intelligent virtual laboratories, AR/VR enhancements, and data-driven insights for both science educators and their students. The paper emphasized the potential for AI to become a lifelong learning partner, supporting individuals of all ages in their pursuit of knowledge and skills.

In conclusion, the integration of AI and ML technologies in science education holds the potential to revolutionize science learning experiences in the near future. When the challenges of nurturing human interaction, and prioritizing equitable access are addressed, we can harness the benefits of technology while upholding the core values of science education and scientific research. This transformative journey demands a harmonious blend of AI-powered tools and the expertise of science educators in creating an educational landscape that prepares students for a future where technology and humanity coexist in harmonious synergy. We also conclude for this to happen, there is need for equitable distribution and availability of AI and ML resources across sections, segments, classes of people and economies to ensure equal access and opportunities for all.

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## Perceived Effects of Early Marriage on Academic Achievement among Girls in Oyo State

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**Abstract.** The research looked at how early marriage affect girls-child academic progress in Oyo State. The study design approach used was a descriptive survey. To direct the investigation, two research hypotheses were developed. Using simple random sample procedures, 200 teachers were chosen from each of the Akinyele and Oyo East Local Governments in Oyo State to participate. The responder was asked to complete a self-designed questionnaire titled "Perceived Implication of Early Marriage on Girl-Child Academic Achievement," using a 4-point Likert scale. Cronbach's test result was 0.76. The t-test statistical method data was examined. The first hypothesis findings indicated that male and female teachers' perceptions of girl-child marriage courses are not significantly different from one another, and the second hypothesis results, based on the experiences of the teachers, indicated that there is no significantly different effect of girl-child marriage on students' academic achievement. Based on these it was recommended that, the public and other governmental organizations should raise awareness of the elements that have been shown to encourage girl-child early marriage and the impact this has on academic attainment. Administrators in the government and the society at large should support the needs of girl children and keep them safe from abuse in order to guarantee that their rights are upheld. There must to be established guidelines and norms to discourage individuals from forcing young girls into marriage. The government should make every effort to ameliorate the existing economic climate, since doing so would end the poverty that drove many young girls into marriage at a young age.

**Keywords:** Academic Achievement, Girl-Child, Early Marriage, Perception

### 1. Introduction

The institution of marriage is ageless; it is the exquisite union of two lives, with each thread standing for a common goal, a shared laugh, and Calantha's hope for the future. Calantha. (2023). He goes on to say that marriage is an unfathomable commitment and a journey full of experiences that shape a lifetime. Matrimony is more than simply a legal agreement; it's a joint journey on which love serves as the north star, understanding as the map, and trust as the compass.

Initiated in every culture, marriage is a process via which people choose their mates. The period on which male and female procreate in accordance with well-defined and accepted societal standards is controlled by an ancient institution. Another way to define marriage is as an institution that formally unites a man and a woman to become one body and one soul in order to fulfill a legal obligation. According to Kendall (2017), marriage is an institution that unites individuals of various cultural and religious backgrounds via a mutual reliance on one another in order to create a household. As defined by Haviland, Prins, McBride, Wathrath (2011), marriage is a relationship in which one or more men either male or female and one or more women either female or male are acknowledged by society as having an ongoing claim to the privilege of having sex.

Underage marriage, also known as child marriage or early marriage, is a practice in which two people who are under the age of majority (usually 18 years old) enter into a legally recognized marriage. This is considered a form of child exploitation and abuse, as it can have severe and long-lasting consequences for the child or young person involved. (UNICEF 2020).

Marriages of this kind are typical in poorer nations. "Early marriage" and "girl-child marriage" are terms

that are often used interchangeably in UN resolutions and publications, with little to no differentiation between them. Some refer to "early marriage, including Girl-child marriage," meaning that while it includes girl-child marriage, it also covers circumstances that do not fall under the definition of child marriage, such as unions in which one or both partners are under the legal age of 18 but have reached majority status according to state law. (2014, UNICEF).

Furthermore, as per the Article on the Convention on the Rights of the Child, any marriage involving a child under the age of eighteen is referred to as a child marriage. It is defined by UNICEF (2005) as both official and informal partnerships in which a girl lives with a partner as if she is married before turning eighteen. It may also refer to any marriage entered into before the girl is physically, physiologically, and mentally prepared to assume the obligations of marriage and childrearing and occurs before the age of eighteen. A number of International Conventions and other instruments, including the African Charter on the Rights and Welfare of the Child, 1990, the Convention on the Rights of the Child, 1989, the Convention on Consent to Marriage, Minimum Age for Marriage, and Registration of Marriage, 1964, view child marriage as a violation of human rights and forbid it.

Concern has been raised about the impact of girl-child marriage on a girl's academic achievement, particularly in emerging African nations. UNICEF field report in 2022 explained that there are 18.5 million school-age children in Nigeria, with over 10 million of them being girls. One of the biggest barriers to education for girls in the current time is early marriage. It has significant negative effects on children's social development, including low educational attainment, poor health, and restricted personal freedom. Girls who are coerced into early marriages have their rights violated, and this has a significant negative impact on their lives due to significantly reduced opportunities for further education. Furthermore, Nguyen & Wodon (2012) demonstrate that the gender gap in schooling may be lessened if a kid is well married and early pregnancies are avoided.

Many authors have proposed causes for early marriage, not only in Nigeria but also in other parts of the world. For example, Hery, Anni, Mas'udah, Fery and Laily (2023) found that low education, financial necessities, young marriage culture, arranged marriages, teenage premarital sex, and poor religious understanding are the causes of early marriage in Indonesia. Several reasons may contribute to early

marriage in Nigeria, including: The socioeconomic status of the parents, particularly the lower-class parents who believe that their female child is an economic burden and that getting her married at young age is the best way to deal with the problem. According to Nour (2009) and Asad (2013), some families see child marriage as a way to protect their daughter's finances and lessen the financial load the kid places on the family. Early marriage or girl-child marriage might be a way to protect the youngster from sexual abuse. According to Nour's (2006) perspective, parents believe that child marriage provides their daughters with a feeling of security from sexual misbehaviour and STDs. Some religious, most notably Islam, supported girl-child marriages or early marriages via sharia law. This is because the Sharia permits marriages between girls and boys who have reached puberty. This might be one of the causes of the prevalence of this kind of marriage among elites as well as illiterates in the northern region of Nigeria.

According to Jimoh 2003, quoted in Mustapha, Aliyu, and Ahmad (2021), women were treated with disrespect and dishonor in most traditional societies across the world, particularly in developing nations like the northern part of Nigeria, while male children were given more importance and honour because they were thought to be the ones to uphold the family name. Therefore, masculine children were given more empowering care than female children.

In their study, "Effect of Early Marriage on the Academic Performance of the Girl-Child in Katsina State," Mustapha, Aliyu, and Ahmad (2021) disclosed that early marriage was caused by a number of factors, such as the need to protect young girls from harm, the pressures of peers and families, the desire to control female behaviour, sexuality, wars, civil conflicts, and sociocultural and religious values.

Child marriage not only deprives girls of their fundamental rights to education, development, and complete childhood, but it may also pave the path for other violent crimes (Boyce, Brouwer, Triplett, Servin, Magis-Rodriguez, and Silverman, 2018). Many females divorce during the first year of marriage due to emotional problems they were not prepared for (Strat, Dubertret, and Foll, 2017). Early marriage presents difficulties for girls in terms of continuing their education and increases the likelihood that they would become victims of marital rape, harassment, and domestic abuse (Pearson and Speizer, 2011 quoted by Bagong, Rahma, Medhy, Nadia, and Siti (2023)

Girls who are not educated may not have the chance to get a decent career and may thus be financially impoverished. This was likely the reasoning behind Q

& A (2013)'s assertion that inadequate education may lead to early marriage and subsequent poverty among female children. According to Q and A, this puts females at greater risk of living in poverty for a long time, particularly if their spouses pass away, leave them, or divorce them. According to Gaffney-Rhys (2011), compared to women who marry later, girls in girl-child marriages are often much younger than their husbands, become widowed earlier in life, and may experience related social and economic difficulties for a longer period of their lives.

In his research, Oguejioffor (2020) examined the effects of early marriage on girls' education in Abakaliki. He concluded that early marriage has a negative impact on a girl's academic performance, leads to school dropout, stifles her desire to pursue an education, and ultimately prevents her from reaching her full academic potential.

Early girl-child marriage is widespread in Nigeria; according to Afri-Dev-Info (2015), the country ranks 10th in Africa with a high rate of child marriage (43% out of 20). The Association for Reproductive and Family Health (ARFH) asserts that child marriage has an impact on a child's physical development, with consequences including early pregnancy, dropping out of school, health problems, domestic abuse, a lack of empowerment, and social isolation. One of the most agonizing and unsettling issues in Nigeria is child marriage, a practice where parents compel their young children, particularly their females, to marry, sometimes to a complete stranger.

The school is the most significant institution outside of the home that helps young people get socialized into all facets of the tasks and responsibilities of adults. Longer schooling has been linked to a number of benefits, such as later marriage ages, reduced fertility, healthier and better-educated offspring, and economic growth. However, early marriage always denies school-age children their entitlement to the education necessary for their personal growth, adult readiness, and meaningful participation in the future upheaval of their family and society.

When a girl's education is stopped to prepare for marriage, her personal growth is halted. The neighborhood and the next generation are also impacted in addition to the girl. Female labour force participation is impacted by child marriage in the area of returns when they are actively working, claim Klasen and Pieter (2012). This is because the rise in unpaid chores might be attributed to a lack of knowledge. However, Chaabn and Cumingham (2011) went on to say that the decline in female labour force participation has a detrimental impact on both women

and their families as well as the economic progress of civilizations. Married ladies may find themselves practically and legally barred from continuing their education.

The ability to enable and guarantee the successful exercise of other human rights is the fundamental component of the rights to health and education. Early marriage feeds the poverty and illiteracy cycle. Girls who are married off as children often drop out of school, which limits their chances of learning and developing the skills necessary to launch their own business or get a job. Low levels of education and employment are therefore more likely as a result (UNICEF, 2011). Many lower-class families do not see their daughters' education as an investment because they believe the prospective benefits are too distant. Many believe that a girl's education will only help her husband's family, not her own.

There is a maxim that, "when you educate a woman, you educate a nation." Nevertheless, some parents also think that girls do not need an education for their responsibilities as spouses and mothers, that education destroys traditional norms, and that education pushes females to reject tradition. Even at the most basic levels of education, education not only prepares students for the workforce and for specific jobs, but it also fosters social skills and aptitude that open doors to crucial resources that reduce poverty. People develop the social skills and personal qualities necessary to access opportunities and resources, build social networks, and ask for help when they need it in the future via their interactions with others. Low labour force participation raises a family's poverty level and reduces the household's contribution to the society's economic development. A person's capacity to contribute to society is limited by poverty, and they are unable to acquire education. Another maxim states that "knowledge is wealth." Because of the - girl-child lack of education, they are in poverty that restricted them to access information. Early marriage has an impact on girls as well since it deprives them of the fundamental skills needed to raise and raise a kid, and it also always causes poverty in the offspring. Additionally, poverty is the architect that tempts girls to repeat their parents' mistakes by encouraging an increase in early marriages. According to Khanna, Verma, and Weiss (2013), denying a girl the chance to study reduces both her chances of finding work and her capacity to acquire practical skills.

A girl's education and aspirations for the future are destroyed by marriage; education provides the formal and fundamental skills needed to contribute to society. Acquired skills boost self-determination and are

crucial to one's professional success; they have a profound effect on both the economy and the development of the person. But a child's ability to succeed in their social network is restricted by a lack of knowledge, which has a psychological effect that traumatizes them later in life.

To curb the menace of early marriage which has contributed immensely to poor academic attainment of girl-child the following solution should be put in place:

- The State House of Assembly may help address the problems associated with girl-child marriage by passing legislation prohibiting it and ensuring that the branch of government responsible for enforcing it takes the law seriously, protecting women's right to an education.
- All branches of the government should also work harder to inform parents and other community members about the detrimental effects of girl-child marriage, such dropping out of school, and to encourage them not to do so in order to help their daughters complete their education.
- Community members should be taught how to determine how many children they can support so that their inability to care for these kids won't result in the exploitation of young girls for financial gain. The government should also pass legislation that would penalize parents who give birth to children they are unable to support.
- The government need to provide impoverished families access to economic possibilities so they can support their kids especially their daughters and prevent school dropouts caused by girl-child marriage. Non-governmental groups should also provide scholarships to support girls' education and provide their basic requirements so that their parents won't have to shoulder as much financial stress. Parents will stop marrying off their daughters at a young age as a result of this.

### 1.1 Statement of the Problem

In most developing countries, particularly in Akinyele and Oyo East Local Government Areas of Oyo State, girls do not receive the same treatment as other children in terms of receiving a proper education and contributing to the development of their environment. The activities of both literate and illiterate people who are involved in this menace have not improved, despite the United Nations, government, and some non-

governmental organizations failing to offer a solution to the problem of girl-child marriage. The intellectual, social, and psychological development of girls in the communities of Akinyele and Oyo East has been severely hampered by this issue. If this issue is not resolved, girls' worth will be zero, and they will be prevented from making the most of their innate abilities, which may have led to greater national progress. Even though a number of academics have studied ways to stop the problem of girl-child marriage in various parts of the nation, Akinyele and Oyo East still need a lot of work, which is likely why the crisis persists.

Thus, the purpose of the study is to examine the underlying causes of girl-child marriage, the effects these marriages have on the academic performance of the daughters, and potential solutions.

The following hypotheses guided the study:

- There will be no significant difference in the perception of the causes of Girl Child Marriage as perceived by male and female secondary teachers
- There will be no significant difference in the effect of girl-child marriage on their academic achievement based on the teacher's teaching experience.

## 2. Methodology

The survey technique was used as the research strategy for the investigation.

The population of the study consist of all secondary teachers in Akinyele and Oyo East Local Government area of Oyo State.

The study sample consists of 400 teachers, of which 200 each were chosen randomly from five secondary's Akinyele and five secondary schools from Oyo East. The study's tool, called PIEMGCAA: Perceived Implication of Early Marriage on Girl-Child Academic Achievement in Oyo State, was utilized to gather pertinent data. The researchers produced this after reviewing relevant material. The questionnaire was split into two sections: Section A included demographic information about the respondents, and Section B addressed how early marriage was perceived to affect girls' academic achievement in Oyo State. Ratings on a 4-point scale were used, with Strongly Agree (SA) = 4, Agree (SA) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1.

The test-retest method was used to determine reliability of the instrument. The reliability of the instrument was shown by the correlation coefficient of 0.76.

Data obtained were subjected to t-test statistical analysis.

### 3. Result and Discussion

#### Hypothesis 1

There will be no significant difference in the perception of the causes of Girl - Child Marriage as perceived by male and female secondary teachers

**Table 1**

Variables	N	X	SD	Cal-t value	Crit-t-value	Remark
Male	206	265.71	88.37	0.02	1.96	.NS
Female	194	363.85	84.87			

The results of the first hypothesis, which states that there won't be any significant variations between male and female instructors' perspectives of girl-child marriage, are shown in Table 1. Statistically, there was no significant difference between the computed t-value of 0.02 and the table value of 1.96. Therefore, the hypothesis was supported by the result. The mean score differences also showed that the male teacher, with a mean score of 265.71, had a greater perspective than the female teacher, with a mean score of 264.85, of the reasons of girl-child marriage.

#### Hypothesis 2

There will be no significant difference in the effect of girl-child marriage on their academic achievement based on the teacher's experience.

**Table 2**

Variables	N	X	SD	Cal-t value	Crit-t-value	Remark
Old Teachers	196	109.20	11.80	0.70	1.96	.NS
New Teachers	204	117.35	12.35			

Table 2 displays the outcome of the second hypothesis, which asserts that, based on the teacher's experience, there will be no discernible difference in the impact of girl-child marriage on academic attainment. The Table showed that the estimated t-value of 0.70 was statistically not significant when compared to the table value of 1.96. The results also showed that, when compared to veteran teachers who have worked between six and twenty years, with a mean of 109.20, new teachers who have been teaching for less than six years, with a mean of 117.35, showed a higher perception of the impact of girl-child marriage on their academic achievement.

Because there is no discernible difference, Hypothesis 1, which claimed that male and female secondary teachers would see the reasons of girl-child marriage differently, was accepted. This result was consistent with earlier research by Mustapha, Aliyu, and Ahmad (2021) on the impact of early marriage on the academic performance of girl-children in Katsina State. That study found that early marriage was caused by a number of factors, including the need to protect young girls from harm, the need to survive economically, peer and family pressure, the desire to control female behavior and sexuality, wars and civil unrest, and sociocultural and religious values. Additionally, according to Nour (2009) and Asad

(2013), some families see child marriage as a way to protect their daughter's finances and lessen the financial strain the kid puts on the family. The teacher's experience supports hypothesis 2, which asserts that there will be no discernible difference in the impact of girl-child marriage on academic achievement. This supports previous findings by Oguejioffor (2020) in his study on early marriage and its impact on girls' education in Abakaliki, which suggested that early marriage negatively impacts a girl's academic performance, leading to school dropout, impeding her ambition to pursue an education, and limiting her ability to reach her full academic potential.

### 4. Conclusion

In addition to its detrimental effects on academic achievement, early marriage of girls has been linked to other psycho-social implications for the girl child, including poverty, domestic violence, illiteracy, and health issues. For this reason, the issue of girl-child marriage and its impact on academic performance has gained significant attention.

## 5. Recommendations

Based on these, the following recommendations are put forward:

- Stakeholders including religious organizations, non-governmental organizations, educational institutions, and the federal, state, and municipal governments should make every effort to lessen the threat of girl-child marriage at an early age.
- The public should be made aware of some elements that have been shown to work against early marriage for girls and their academic success via the media and other government channels.
- The society as a whole and government officials should make sure that the rights of the Girls'-child needs are satisfied by providing for them and shielding them from harm, although by-laws exist, but implementation hasn't been fully achieved, hence guidelines should be established to discourage individuals from pressuring young girls to marry at a young age.
- The Millennium Development Goals statement published by the UN places a strong emphasis on universal primary education must be provided to all children, and parents who do to provide for their children's education should face consequences.
- Where men and women are interested in the community, there is a need to promote community participation talks that address issues including early marriage, presenting oneself, and income producing activities, which will lessen the emergence of early marriage.
- The government should make every effort to ameliorate the existing economic climate, since doing so would end the poverty that drove many young girls into marriage at an early age.

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## Enhancing Student Engagement through Practical Production and Utilization of Instructional Materials in an Educational Technology Class: A Multifaceted Approach

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**Abstract.** This comprehensive examination delves into the significance of instructional materials in fostering student engagement, exploring the practical production and utilization of innovative materials to enhance learning experiences. By integrating theoretical foundations with hands-on applications, this approach aims to revitalize the educational landscape. Through the creation and implementation of interactive materials such as 3D models, cut-out displays, and tactile aids, educators can cater to diverse learning styles, promote active participation, and facilitate deeper understanding. This study highlights the importance of visual aids for conceptual clarity, interactive elements for experiential learning, multisensory experiences for retention and recall, collaborative opportunities for social learning, real-world connections for contextual relevance, By embracing the practical production and utilization of instructional materials, educators can, boost student motivation and enthusiasm, develop critical thinking and problem-solving skills, encourage creativity and innovation, foster inclusive learning environments, enhance academic achievement and retention. It underscores the transformative potential of instructional materials in modern education, emphasizing the need for educators to harness their creative potential to craft engaging, effective, and student-centered learning experiences. The paper concludes that instructional materials play a crucial role in supporting teaching and learning and recommends that teachers should conduct needs assessments to determine learning objectives and material requirements.

**Keywords:** Instructional material, hands-on applications, learning experiences, interactive material and needs assessment.

### 1. Introduction

Instructional materials play a vital role in facilitating learning and enhancing student engagement in the classroom. They are resources used to support teaching and learning, helping to convey information, concepts and skills to students. These materials can take various forms, including:

- Textbooks and workbooks
- Online resources and educational websites.
- Multimedia content like videos, podcasts and interactive simulations
- Visual aids such as diagrams, charts and infographics.
- Hands-on materials like manipulatives, kits and equipment for experiments
- Assessments and quizzes to measure student understanding
- Educational games and activities

Instructional materials are a vital component of the educational process, serving as a catalyst for effective teaching and learning. These materials play a crucial role in facilitating the conveyance of knowledge, skills and values from instructors to learners, thereby enhancing the overall learning experience. The strategic use of instructional materials can significantly impart students' engagement, motivation and academic achievement.

The effective use of instructional materials is a cornerstone of successful teaching and learning (Okebukola, 2006). These materials serve as a bridge between the teacher's instruction and the student's learning, facilitating the acquisition of knowledge, skills and attitudes (Bower 2007). Producing instructional materials is a critical skill in educational technology. The use of instructional material in the

class is followed by a well prepared and produced instructional material. By involving students in the production process, we can enhance their engagement, creativity and technical skills. The importance of the production of instructional materials cannot be over-emphasized. Smith, P.L, and Ragan, T.J (2005) in their books, instructional Design, provides a comprehensive guide to the production of instructional materials and emphasized the importance of the production and the usage of instructional material in the classroom. As a means of equipping my students with the knowledge of the production of instructional design and utmostly to improvise where it becomes difficult to produce, I have decided to involve them in this onerous task in design so as to enable them have knowledge of the production as students of educational technology and as would be teachers.

## **2. Steps in the production of instructional materials.**

The following practical production steps are involved in the production of instructional materials:

- Define learning objectives
- Choose appropriate material types
- Design and create content
- Review and Revise
- Implement and Evaluate
- Production and use of instructional materials

The production and use of Instructional materials is crucial aspect of teaching and learning (Smith and Ragan 2005). Effective instructional materials can enhance student engagement, motivation and learning outcomes (Hativa, 2013). However, the production of instructional materials requires careful consideration of several factors including learning objectives, content and media (Dick and Carey, 2004). Research has shown that instructional materials can be designed to support diverse learning styles and abilities (Tomlinson, 2003). Multimedia materials, such as videos and interactive simulations can be particularly effective in promoting deeper understanding and retention of subject matter (Mayer, 2009).

The use of instructional materials requires teachers to have adequate training and support (Olivia, 2009). In recent years, there has been a shift towards digital instructional materials, which offer greater flexibility and accessibility (Bower, 2007). However, the production and use of digital materials require careful consideration of issues such as copyright, accessibility and technical support (Morrison et al, 2004).

Generally, instructional materials also called instructional resources are indispensable in the

teaching and learning process for they are tools employed to reach the goals and objectives at various level. Thus, anything that stimulates a learner and results in the understanding of the curriculum content maybe classified as a learning resource. According to Ughamadu (2006) anything which the teacher and in fact the entire class utilize for the purpose of making teaching-learning process more effective could be classified as a resource. Teaching and learning resources according to Ofoegbu (2009) are those resources that facilitate the achievement of the goals of education.

Instructional resources/materials are those devices or instruments which are employed by the teacher in a teaching-learning process to convey meaning and facilitate effective teaching and proper understanding. Thus, instructional materials are those things that are employed to facilitate inculcation of learning experience to the learner to ensure the achievement of the nation's educational objective. Instructional material when appropriately utilized during the teaching and learning enhance learning and improve the teaching competence of teachers. In fact, they make learning more meaningful to learners. They have been classified as printed materials (examples textbooks, journals, posters) and non-printed materials (examples: chalkboard, flannel board, models, 16mm film projectors) they have also been classified as audio material or aids (examples: radio, audio-tapes record players): visual materials or aids example: pictures, charts, maps, real things, models, mock-ups) and audio-visual materials examples: instructional or instructional television.

Most people often ask if teaching materials are important in the teaching/learning situation. This question can be answered when we take the roles teaching materials play in the education of the student. In teaching languages, English language in particular, and other subjects teaching aids/materials production in the form of improvisation and usage are important because every individual has the tendency to forget but proper use of these materials help the students to remember lessons permanently. All teaching aids can be effectively used and produced in class to motivate the students to learn better.

Teaching/Instructional materials are especially important to learn a new language and other subjects because they develop the proper images in their mind and create an interesting atmosphere for the student to make learning easy and clear. It is important to further highlight the roles of instructional materials in the teaching and learning process to include the following:

- They hold retention and save the teacher time and keep the learner busy
- They capture the learners' interest and add variety and break the monotony of instruction
- The use of instructional material arouses curiosity, stimulate imagination and enlarge the learners and teachers view point.
- They develop continuity of thought and concretize the abstract
- Educational media saves the teacher much efforts
- Learning process is reinforced by the use of additional sensory experience.
- Other uses of instructional materials are:
- Classroom instruction: Materials support face-to-face teaching.
- Online courses: Materials are used in digital learning environments.
- Self-study: Materials enable independent learning.\
- Training and development: Materials support professional growth.
- Assessment and evaluation: Materials help measure learner progress.

By understanding the benefits and challenges, instructional designers and educators can create effective materials that support learning and address the needs of diverse learners.

### 3. Types of media materials/instructional

For the purpose of this study a proper delineation has to be done for a better understanding of our study. Media materials and instructional materials are related but not exactly the same thing. Media materials refer to the various forms of communication used to convey information, entertainment or educational content to audiences. On the other hand, instructional materials are specifically designed to support teaching and learning. They are resources used to convey knowledge, skills or attitudes and are typically created with a learning objective in mind.

Instructional materials can include media materials, but also encompass other resources like: Textbooks, Workbooks, Lesson plans, educational software, Online course, Simulations, Games, Quizzes, Assessments. In other words, all instructional materials are media materials but not all media materials are necessarily instructional materials. Media materials can be used for entertainment, information or other purposes beyond instruction.

By way of distinction Reiser and Dempsey (2012) distinguished between instructional media (eg text,

images, audio, video) and instructional materials (eg textbook, workbooks, software), emphasized that materials are typically more comprehensive and structured. Reiser and Dempsey distinguish between instructional media (e.g., text, images, audio, video) and instructional materials (e.g., textbooks, workbooks, software), emphasizing that materials are typically more comprehensive and structured. Smaldino et al. define instructional media as the channels or tools used to convey messages, whereas instructional materials are the actual content and resources used to support learning. Morrison et al. differentiate between instructional media (e.g., text, graphics, audio, video) and instructional materials (e.g., lesson plans, assessments, educational software), highlighting that materials are more focused on learning outcomes. Dick et al. discuss instructional media as the means of communicating information and instructional materials as the resources and activities designed to support learning. These references provide a solid foundation for understanding the distinctions between instructional media and materials.

Instructional materials are a vital component of the educational process, serving as a catalyst for effective teaching and learning. These materials play a crucial role in facilitating the conveyance of knowledge, skills, and values from instructors to learners, thereby enhancing the overall learning experience. The strategic use of instructional materials can significantly impact student engagement, motivation, and academic achievement. In teaching and learning a well-designed instructional material can help to:

1. Clarify complex concepts and ideas
2. Support diverse learning styles and abilities
3. Encourage active learning and participation
4. Provide opportunities for practice and reinforcement
5. Facilitate assessment and feedback
6. Promote inclusivity and cultural sensitivity
7. Foster critical thinking, creativity, and problem-solving skills

On the part of the teacher effective use of instructional materials can also help teachers to:

1. Save time and effort in lesson planning and preparation
2. Differentiate instruction for varied learner needs
3. Create a structured and organized learning environment
4. Encourage collaboration and teamwork among students
5. Stay updated with curriculum changes and developments

In today's digital age, instructional materials have evolved beyond traditional textbooks and chalkboards to include a wide range of digital resources, such as educational software, online courses, and multimedia content. This shift has opened up new possibilities for personalized learning, increased accessibility, and global connectivity.

However, the successful integration of instructional materials requires careful consideration of factors such as:

1. Learning objectives and outcomes
2. Student needs and preferences
3. Teacher expertise and training
4. Technological infrastructure and support
5. Cultural and linguistic diversity

**Some of Our Produced Instructional Materials Used in Teaching Some Secondary School Subjects**

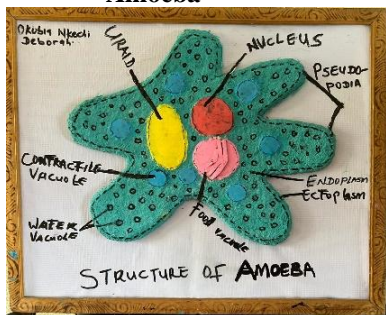


**Computer**

A computer cut out from a carton as an improvised instructional material

1. Visual aid: The carton computer cutout can serve as a visual aid to help students understand the basic components of a computer, such as the monitor, keyboard, and CPU.
2. Interactive learning: Students can use the cutout to create a mock computer setup, exploring the different parts and their functions.
3. Creative projects: The cutout can be used as a base for creative projects, such as creating a computer model or designing a futuristic computer.
4. Storytelling: The cutout can be used as a prop for storytelling, helping students to create scenarios and stories related to computer use.

**Amoeba**



1. Visual representation: The papier-mâché amoeba serves as a 3D visual aid to help students understand the structure and shape of an amoeba.
2. Interactive learning: Students can explore the texture and shape of the amoeba, enhancing their tactile learning experience.
3. Biological concepts: The amoeba model can be used to teach various biological concepts, such as: Cell structure and function, Cellular transport (e.g diffusion, osmosis), Microscopic organisms
4. Creative projects: Students can use the amoeba model as a base for creative projects, such as: creating a diorama of an amoeba's habitat, designing an amoeba-inspired sculpture.

**Horsewhip**



1. Natural insect repellent: The roots of certain plants, such as citronella or lemongrass, have natural oils that can repel flies.
2. Organic farming: Using a horsewhip made from plant roots can be a sustainable and eco-friendly way to manage pests in organic farming.
3. Outdoor activities: The horsewhip can be used to ward off flies during outdoor activities like hiking, camping, or picnics.
4. Animal protection: The horsewhip can be used to protect animals from fly bites, especially in rural areas where animals are more susceptible to fly-borne diseases.

**Farm Carrier (Village Basket)**



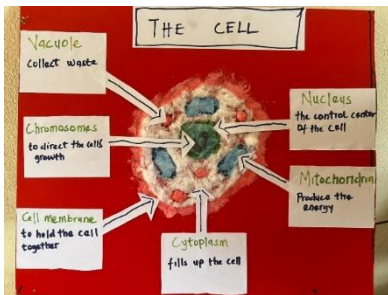
A local carrier or village basket made with canes for carrying products from the farm in a typical village setting

- Canes (e.g., bamboo, rattan, or local reeds)
- Thinner cane strips or fibers for weaving

**Wooden or bamboo frame (optional)**

1. Carrying farm products: Use the carrier to transport fruits, vegetables, grains, or other farm products from the field to the village market or home.
2. Gathering firewood: Collect firewood and other forest products with the carrier.
3. Carrying goods: Use the carrier for general transportation of goods, such as carrying water, Cassava, Yam, Corn other essentials.

**The Cell**



A cell made of wool, color, and other materials can be a creative and interactive way to teach students about cellular structure and function. Here are some importance and uses of such a model:

**Importance:**

1. Visual aid: A colorful, tactile model helps students visualize and understand complex cellular components.
2. Engaging learning: Interactive materials like wool and other textures make learning fun and engaging.

Uses:

1. Teaching cell structure: Illustrate cell membrane, cytoplasm, nucleus, and other organelles using different materials.
2. Demonstrating cell functions: Show how cells divide, grow, and respond to stimuli using the model.

**Abacus**



The abacus is an ancient calculating tool that has been used for thousands of years, with a rich history and significance. Here's an overview of its importance, production, and usage:

**Importance**

1. Early calculating tool: The abacus was one of the first calculating tools, allowing for basic arithmetic operations like addition and subtraction.
2. Developed mental math: Using the abacus helped people develop mental math skills, improving cognitive abilities.

Construction: The abacus consists of a frame with wires or rods, holding the beads in place.

**Parts of Plants**



A cut-out part of a plant from polythene material can be used for various educational and creative purposes, such as:

1. Plant anatomy models: Create 3D models of plant structures like leaves, stems, roots, and flowers to teach students about plant anatomy.
2. Botany lessons: Use the cut-outs to demonstrate plant growth, development, and functions,

**Climbing Rope**

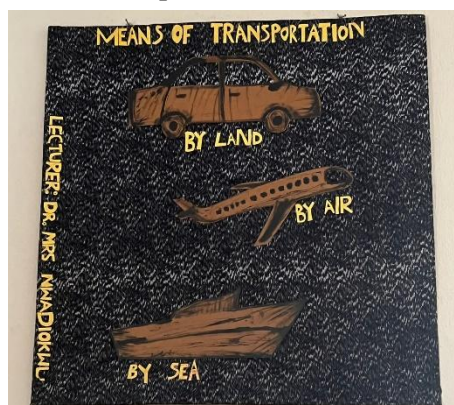


A traditional climbing rope (like a coconut tree climbing rope) can be used to teach various concepts, such as:

1. Cultural significance: Sharing the importance of coconut trees and traditional climbing methods in various cultures.

2. Physical education and fitness: using rope climbing as a fun way to improve strength, endurance and agility

### Means Transportation



A cut-out airplane, ship, and trailer and a means of transport on a flannel board as an instructional material

#### Importance:

1. Visual representation: Provides a clear and concise visual representation of different modes of transportation.
2. Interactive learning: Encourages hands-on learning and exploration.
3. Multisensory experience: Engages students through sight and touch.
4. Real-world connections: Helps students understand real-world transportation systems.

#### Usage:

1. Transportation lessons: Teaches students about different modes of transportation and their uses.
2. Storytelling and scenarios: Creates interactive stories and scenarios to teach transportation concepts.
3. Geography and mapping: Demonstrates route mapping and geography skills.

By thoughtfully selecting and utilizing instructional materials, educators can create a rich, engaging, and effective learning environment that supports the diverse needs of all students and helps them achieve their full potential.

Instructional materials are resources used to support teaching and learning, helping to convey information, concepts, and skills to students. These materials can take various forms, including:

1. Textbooks and workbooks
2. Online resources and educational websites
3. Multimedia content like videos, podcasts, and interactive simulations
4. Visual aids such as diagrams, charts, and infographics
5. Hands-on materials like manipulatives, kits, and equipment for experiments

6. Assessments and quizzes to measure student understanding

7. Educational games and activities

In teaching and learning Effective instructional materials are:

- Aligned with learning objectives and outcomes
- Relevant and engaging for the target audience
- Accurate, up-to-date, and unbiased
- Accessible and inclusive for diverse learners
- Flexible and adaptable for different teaching methods and environments

Instructional materials play a crucial role in enhancing the learning experience, supporting teacher instruction, and promoting student achievement.

Okebukola in his article, significance of instructional materials in enhancing teaching and learning outcomes, emphasizes that instructional materials play a crucial role in: Facilitating effective instruction, promoting student engagement and motivation, supporting diverse learning, styles enhancing teacher productivity, and improving academic achievement. The author also discusses the characteristics of effective instructional materials, including relevance, accuracy, and cultural sensitivity. He further emphasizes that the effective use of instructional materials is a cornerstone of successful teaching and learning. These materials serve as a bridge between the teacher's instruction and the student's learning, facilitating the acquisition of knowledge, skills, and attitudes. Instructional materials play a vital role in:

- Enhancing student engagement and motivation
- Supporting diverse learning styles and abilities
- Promoting deeper understanding and retention of subject matter
- Encouraging active learning and critical thinking
- Providing opportunities for practice and feedback
- Facilitating assessment and evaluation of student learning

The importance of instructional materials cannot be overstated. They help teachers to:

- Clarify complex concepts and ideas
- Organize and structure their teaching
- Differentiate instruction for varied learner needs
- Stay updated with curriculum changes and developments

Moreover, instructional materials have evolved significantly in recent years, with the advent of digital technologies and online resources. This shift has opened up new possibilities for:

- Personalized learning and adaptive instruction
- Increased accessibility and inclusivity
- Global connectivity and collaboration
- Real-time feedback and assessment

Despite these advances, the effective use of instructional materials remains a challenge for many educators. Factors such as limited resources, inadequate training, and insufficient support can hinder the successful integration of these materials into teaching practice. Therefore, it is essential to explore the role of instructional materials in teaching and learning, examining their benefits, challenges, and best practices. By doing so, educators can harness the full potential of these resources to enhance student learning outcomes and achieve educational excellence.

#### Some Common Types of Media Materials

1. **Print Media:** Physical materials like newspapers, magazines, books, brochures, and posters.
2. **Digital Media:** Online content like websites, social media, blogs, podcasts, and e-books.
3. **Broadcast Media:** Audio and video content shared through radio, television, and online streaming platforms.
4. **Visual Media:** Images, graphics, videos, and films used to communicate messages or tell stories.
5. **Audio Media:** Music, podcasts, audiobooks, and voice messages used to convey information or entertainment.
6. **Interactive Media:** Video games, simulations, and virtual reality experiences that engage users.
7. **Multimedia:** Combinations of text, images, audio, and video, like presentations, infographics, and animations.
8. **Social Media:** Online platforms for user-generated content, like Facebook, Twitter, Instagram, and TikTok.
9. **Outdoor Media:** Billboards, signs, and public displays used for advertising and announcements.

Dick et al. discuss instructional media as the means of communicating information and instructional materials as the resources and activities designed to support learning.

These references provide a solid foundation for understanding the distinctions between instructional media and materials.

For this study, Kemp's instructional design model (1985) and Assure Model by Heinich et al (2002) were adopted as development models of our production of instructional materials

1. **Kemp's Instructional Design Model (Kemp, 1985)**  
**Context:** Identify learning objectives, audience, and learning environment.  
**Content:** Determine the subject matter and learning activities.  
**Learning Activities:** Design activities that support learning objectives.

**Assessment:** Develop assessments to measure learner performance.

**Implementation:** Deliver the instruction and support learners.

Kemp's model emphasizes the importance of context and learning activities in instructional design.

#### 2. ASSURE Model (Heinich et al., 2002)

**Analyze:** Identify learning objectives, audience, and performance gaps.

**State:** Clearly state learning objectives and outcomes.

**Select:** Choose appropriate media and materials.

**Utilize:** Implement the instruction and support learners.

**Require:** Assess learner performance and instructional effectiveness.

**Evaluate:** Refine the instruction based on feedback and assessment.

The ASSURE model provides a comprehensive framework for instructional design, emphasizing analysis and evaluation.

#### Benefits of Production of Instructional Materials

1. **Improved learning outcomes:** Well-designed instructional materials can enhance student engagement, understanding, and retention.
2. **Increased efficiency:** Instructional materials can reduce instructor preparation time and improve delivery consistency.
3. **Cost-effectiveness:** Reusable materials can reduce costs associated with instructor-led training.
4. **Flexibility:** Instructional materials can be used in various settings, such as classrooms, online courses, or self-study.
5. **Accessibility:** Materials can be designed to accommodate diverse learning needs and abilities.

#### Challenges of Production of Instructional Material

1. **Development time and costs:** Creating high-quality instructional materials can be time-consuming and expensive.
2. **Maintenance and updates:** Materials may require regular updates to remain relevant and accurate.
3. **Compatibility issues:** Materials may not be compatible with all devices or platforms.
4. **Limited interactivity:** Some materials may lack engagement and interactivity.
5. **Dependence on technology:** Technical issues can hinder material accessibility.

#### 4. Conclusion

Instructional materials play a crucial role in supporting teaching and learning. Effective materials can enhance learning outcomes, increase efficiency, and reduce costs. However, development and maintenance can be time-consuming and expensive. Compatibility,

interactivity, and technology dependence are also concerns.

In conclusion, the practical production and utilization of instructional materials play a vital role in enhancing student engagement, motivation, and overall learning outcomes. By harnessing the potential of innovative materials, educators can create immersive, interactive, and inclusive learning environments that cater to diverse student needs.

Through the strategic use of visual aids, 3D models, cut-out displays, and tactile aids, educators can: Simplify complex concepts, foster deeper understanding, encourage active participation, develop critical thinking and problem-solving skills, promote creativity and innovation, enhance academic achievement and retention, moreover, the creation and implementation of instructional materials offer opportunities for educators to: reflect on their teaching practices, adapt to changing student needs, integrate technology and multimedia resources, collaborate with colleagues and students, continuously assess and improve instructional effectiveness

Ultimately, the practical production and utilization of instructional materials have the power to transform the educational landscape, making learning more engaging, effective, and enjoyable for all students. By embracing this approach, educators can unlock the full potential of their students, empowering them to succeed in an ever-changing world.

As we move forward, it is essential to continue exploring innovative materials, technologies, and pedagogies that can further enhance student engagement and learning outcomes. By doing so, we can ensure that education remains a dynamic, responsive, and student-centered enterprise, equipped to meet the challenges of the 21st century.

### 5. Recommendations

From this study the following recommendation / suggestion were made:

1. Conduct needs assessments to determine learning objectives and material requirements.
2. Design materials that are engaging, interactive, and accessible.
3. Use a variety of formats to cater to different learning styles.
4. Regularly update and maintain materials to ensure relevance and accuracy.
5. Consider digital formats for flexibility and ease of updates.

6. Pilot-test materials to ensure effectiveness and identify areas for improvement.

7. Provide training and support for instructors and learners.

8. Evaluate material effectiveness through feedback and assessment.

By following these recommendations, educators and instructional designers can create effective instructional materials that support learning and teaching.

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## Demographic Variables as determinants of Head Teachers Administrative Practices in Public Primary schools in Edo State, Nigeria

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**Abstract.** The study investigated demographic variables as determinants of head teachers' administrative practices in public primary schools in Edo state. To guide the study, four research questions were raised. Research question 1 was answered directly while 2 to 4 were hypothesized and tested at 0.05 alpha level. This study was a survey research that adopted correctional design. The population of the study was one thousand and forty-two (1042) public primary schools and the one thousand and forty-two (1042) head teachers in Edo State. The multi-stage method was adopted to select the sample size. A questionnaire titled: "demographic variables as determinants of head teachers' administrative practices questionnaire (DVDHTAPQ)" which had two sections A and B was used to collect data for the study. Analyses were carried out using mean, standard deviations, ranks and independence T-test statistics. The findings from the analysis of the study revealed that the common administrative practices of head teachers in primary schools in Edo state were: instructional management, staff personnel administration, student personnel administration, school plant management, financial management and School-community relations; The study revealed that there is no significant difference in the administrative practices of head teachers in primary schools in Edo state based on gender. The finding further showed that there is a significant difference in the administrative practices of head teachers in primary schools in Edo state based on age and educational qualifications. Based on the findings, the study recommended that Age and Qualification should be considered as a factor when appointing head teachers in primary schools in Edo state. However, Gender should not be considered as a factor when appointing head teachers because the administrative practices of head teachers in primary schools in Edo state do not differs based on gender.

**Keywords:** Demographic Variables, Head Teachers, Administrative Practices.

### 1. Introduction

Primary school education serves as a child's first introduction to the world of education, a world which would dominate and shape their lives in the subsequent years. A child's economic and social success is determined to a significant extent by how well he or she performed in school during the first critical years under the guidance of the teachers. These teachers in turn are supervised by the head teachers.

Head teachers as the school manager of primary schools are charged with the daunting administrative task of managing teachers, pupils, parents, physical facilities and other resources available for the attainment of the objectives of education in the primary schools. Head teachers are responsible for the overall running and control of the school and for the maintenance of the tone and all- round standards. The organisation and control of the teaching and non-teaching staff are all part of the head teachers' administrative tasks. Importantly, the head teachers must check the teaching standards by making reference to schemes of work, lessons notes, and records of work done and pupils' exercise books. Some of the administrative tasks of the head teachers include preparing internal rules and regulations in accordance to the school goals, guiding the behaviour of pupils and teachers, ensuring the preparation and update of staff files, signing pupils school scripts or certificates and other official documents, authorizing circumstantial leave of staff members of the school, motivating staff and pupils, coordinating school ceremonies and carefully listening to staff pupils and help them find adequate solutions to their problem (Mosiori & Thinguri 2015).

Head teachers are the custodian of primary schools' administration, they keep track of educational events and implement educational policies; head teachers keep records, monitor students and staff in the school environment. They are also seen as the father and mother of primary school administration. In this regard, a head teacher is expected to be competent in his administrative practices. According to Eberechukwu and Nsan (2012), for primary schools to do well, head teachers must employ good administrative practices. They observed that head teachers provide instructional leadership and run the day-to-day activities in primary schools. Head teachers oversee the activities of staff and students, monitor students' progress in education, motivate and inspire teachers, besides maintaining standards set by educational policies (Eberechukwu & Nsan). The head teachers run students' career counseling among other students' services, besides maintaining school-community relationship. Head teachers are the fulcrum on which the success of primary school education revolves; hence, they interpret educational policies and put them into action through their administrative practices.

According to The Wallace Foundation (2012), Administrative practices are administrative behaviours, actions or activities administrators carry out for the success of their organization. It emphasized that the success of the practice itself is dependent on its rate and quality. Good administrative practice is a sine qua non to school success. Administrative practices of head teachers are the various ways or methods of carrying out their numerous administrative roles to attain the objectives of their office. Procter (2004) opined that administrative practices include both the method of working and the habitual carrying out of the management of the affairs of institutions, including primary schools. Head teachers' administrative practices are a collection of strategies that the head teacher adopts to achieve intended outcomes. Shelton (2011) succinctly categorized head teachers' administrative practices into six which are: instructional management, staff personnel administration, student personnel management, school plant management, financial management, and school-community relations management.

Instructional management or instructional leadership behavior has to do with what the school head teacher does to promote or direct teaching and learning in schools. Instructional management involves planning of instruction, organization, promotion, supervision and evaluation of instruction as well as taking new decisions about improvements of instructions (Mgbodile, 2004). In this context, Haruna (2008) notes

that instructional management is the first and the most important responsibility of a school head teacher. He further explained that schools exist primarily to inculcate worthwhile values, attitudes, skills and competencies in students which should be the main spotlight of a head teacher. This could be one reason why Carter (2008) asserted that the basic guide for evaluating head teachers rest squarely on the head teachers' leadership ability in instructional management. Similarly, Chika and Ebeke (2007) observed that among many factors that influence school learning and achievement in primary schools, head teachers' instructional management appears to be the major prevailing factor.

The second cardinal administrative practices or behaviors of the school administrator are those related to staff personnel administration. Oboegbulem (2004) sees staff personnel administration as manpower or human resource management in an organization. Staff personnel administration includes such activities as: recruitment of staff, maintenance, training and development, compensations, policies and evaluation of staff for educational activities (Mgbodile, 2004). In a similar view, Kontz in Haruna (2008) defined personnel administration as an act of planning, directing/leading, and coordinating the activities of individuals to achieve a goal. It involves instructing, monitoring, motivating and coordinating the performance of people to attain desired success.

Beside staff personnel administration, Boe (2001) has identified head teachers' administrative practices as directly related to student personnel administration. In this regard, effective student personnel management with its resultant academic improvement of the students is the most viable measure of effective student personnel management. Obegbulem (2004) stated that students personnel administration involves all the activities and services, apart from the normal classroom interaction, rendered to the students by the head teacher, staff (tutorial and non-tutorial), the students themselves and even the community that are geared towards making an individual in the school an all-round educated, law-abiding citizen of his community. Haruna (2008) posited that student personnel administration in primary school involves all the activities and services that are rendered to the students for the achievement of educational objectives, which are not the normal classroom instructions. He maintains that it is viewed by educators as one of the main tasks of school administration, a task which involves the co-operation of the head teacher, the staff, students and the community in pursuing the common goal of the school

The school plant refers to the school site, the buildings, the playground, the equipment and other material resources provided in the school for effective teaching and learning (Onuorah, 2004). Similarly, Mgbodile (2004) described the school plant as the space interpretation of the school curriculum. For Engman (2008) the school plants are basically educational facilities. Against this background, Osahn in Onwurah (2004) grouped the educational facilities (school plant) into various types. These are: School building, equipment and school records/books, among others. According to Obi (2004), Educational facilities are necessary tools in the school for effective teaching and learning. As noted by Mgbodile (2004), school plants are needed for developing the cognitive areas of knowledge, abilities and skills which are needed for academic achievement. In view of this, Ezugwu (2004) argued that properly designed and fully utilized school plant with wide array of teaching aids provide effective delivery of school's curriculum are positively related to academic achievement.

Financial management is an integral part of the overall administrative practices of a head teacher. Hence, the management of funds disbursed to schools is the responsibility of the school head teacher (Abayi, 2002). Financial management is the efficient use of economic resources like capital funds (Corbally, 2006). Parsuramen (2003) submitted that financial management practices deal with procurement of funds and their effective utilization in an organization, including schools. However, as Abayi (2002) observed, the financial management helps the stakeholders in ensuring that resources allocated for provision of education, are used for the intended purposes effectively and economically. Similarly, Haruna (2008), on financial management, hold the view that financial management is the raising of funds, utilization of funds, planning of future operations and controlling current performances through financial accounting, budgeting and statistical analysis.

A school community relationship is a series of pined activities and media through which the schools seek to learn about the community, inform the community about and interpret, when necessary, the purposes, programmes, problems and evaluating school policies and progress (Bortner, 2019). It is a mutual interaction between the school and the community whereby they gain mutual help and understanding from each other as well as being fully aware of one another's activities, policies, plans, programmes, problems, progress and failures (Afolabi, 1998). Fostering good school-community relationship is another essential aspect of administrative practices of a school head teacher (Paul, 2008). Although, there are laws and minimum standards guiding establishment of primary schools, it

is certain that the schools cannot operate successfully without public support. For example, having effective school plant requires that the head teacher should have effective public relations that give support in the provision of certain material resources. School-community relations can be referred to as the degree of rapport, understanding and goodwill between the school and the community (Oboegbulem, 2004). This also focuses on the school as a social institution planned to serve the needs of the society. Thus, the school cannot operate in a vacuum; it must operate within the ambit or domain of the society it serves.

Operationally, administrative practices of head teachers refer to the head teachers' methods, ways, steps or strategies for carrying out their administrative obligations or duties. It is a process of implementing administrative ideas, theory or plans by the head teachers to achieve school success. Head teachers' administrative practices in this study relate to the way head teachers carry out their instructional management, staff personnel administration, student personnel management, school plant management, financial management, and school-community relations management. Meanwhile there has been so much debate on how the demographic variables of head teachers could influence their administrative practices in primary schools.

Demographic variables, as conceived by Gregoire (2009), are the characteristics or peculiarities of a given population that vary among members of that population. Specifically, demographic variables of head teachers as used in this study are the characteristics, attributes or peculiarities of head teachers that vary amongst the head teachers, while, demographic variables as determinants of head teachers' administrative practices are the characteristics of the head teachers that may influence head teachers' administrative practices. Demographic variables of interest in this study are gender, age and educational qualifications of the head teachers.

There has been so much debate on how gender could influence the administrative practices of head teachers in primary schools. Pollard and Morgan (2002) describes Gender as the socially constructed belief for male and female behaviours, which also delineates the responsibilities, rights and obligations between male and female. It is social and historical constructs derived from biological sex that demarcates masculine and feminine roles, behaviours, attributes and ideologies. Some studies reviewed believe that no significant difference exists in the way both gender carries out their administrative practices. While some other studies reveal that males are more successful in

their administrative practices than their female counterpart. Therefore, gender was considered as a factor in this study.

Another focus of interest in this study is the influence of a head teacher's age on his administrative practices. The age of head teachers could also be a factor that could influence their administrative practices; this assertion may not be unconnected with the fact that experience increases with age. This further suggests that the older a head teacher is, the better his or her administrative practices could be. However, in some quarters, there is a disagreement on the relationship between age and the head teachers' administrative practices for instance, some studies reviewed argued that age may not affect head teachers' administrative practices while other studies believe that age could influence the head teachers' administrative practices because the older the head teacher, the better his or her administration prowess could be. Hence the consideration of the influence of head teachers age on their administrative practices.

Achievement with regard to school administration requires that a head teacher should possess the necessary educational qualification in order to fulfill his/her administrative obligations. Head teachers' educational qualifications refer to the different levels of educational qualifications the head teachers possess. Educational training of head teachers exposes them to knowledge, skill, proficiency and sophistication required for excellent administrative practices. Head teachers' administrative practices may differ based on their educational qualification. Some studies contend that educational qualification of head teachers may not always impact on their administrative practices while other studies believes that educational qualification may influence head teachers' administrative practices. Therefore, educational qualification of head teachers was considered as a factor in this study.

It must therefore be pointed out that effective administrative practice of primary school head teachers is crucial in the realization of primary school goals and objectives as stipulated in the National policy on Education. A country can only actualize its various purposes of education when the objectives of primary education are met and this would further depend on the effectiveness of administrative practices of the public primary school head teachers as they perform or execute their administrative tasks among other factors. It is on this premise that this study is carried out to investigate the influence of demographic variables on head teachers' administrative practices in public primary schools in Edo state

### **1.1 Statement of the Problem**

It is quite in place to assert that the head teacher is the foundation upon which the success of primary school administration revolves. In this context, the success of primary school administration is supposedly contingent upon the head teacher's administrative practices. Consequently, head teachers' administrative practices can make or mar the success in the school. However, it has been speculated by relevant stakeholders in education such as teachers, parents and Ministry of Education officials that the administrative practices of most head teachers in recent times are poor, ineffective and inefficient. This is due to the seemingly poor coordination of the school activities. For instance, it has been observed that head teachers of public primary schools devote more of their time attending to visitors instead of supervising instructional activities in the school.

Also, it has been observed that there is high rate of truancy and indiscipline among teachers, high incidence of students' transfer from one school to another, high rate of teachers' absenteeism, lateness to school and low productivity which suggest poor administrative practices of head teachers

Other visible challenges appear to be improper handling of parental complaints and lack of cooperation with other community agencies, inability to keep the school office running smoothly, improper accounting of school finances, inadequate maintenance of the school's plants through the repairs and replacement of school facilities or new construction as the need arises.

Could the difference in demographic variables of head teachers be responsible for the perceived poor administrative practices of some head teachers in public primary schools in Edo State?

This study is, therefore, carried out to investigate demographic variables as determinants of head teachers' administrative practices in public primary schools in Edo state

### **1.2 Research Questions**

The following research questions guided this study:

- What are the common administrative practices of head teachers in public primary schools in Edo state?

- Is there any difference in the administrative practices of head teachers in public primary schools in Edo state based on gender?
- Is there any difference in the administrative practices of head teachers in public primary schools in Edo state based on age?
- Is there any difference in the administrative practices of head teachers in public primary schools in Edo state based on educational qualification?

### 1.3 Hypotheses

Ho<sub>1</sub>: There is no significant difference in the administrative practices of head teachers in public primary schools in Edo state based on gender

Ho<sub>2</sub>: There is no significant difference in the administrative practices of head teachers in public primary schools in Edo state based on age

Ho<sub>3</sub>: There is no significant difference in the administrative practices of head teachers in public primary schools in Edo state based on qualification

### 1.4 Purpose of the Study

The purpose of the study was to investigate head teachers' demographic variables as determinants of head teachers' administrative practices in public primary schools in Edo State.

Specifically, the study sought to:

- find out the common administrative practices of head teachers in primary schools in Edo state ;
- ascertain if there is any significant difference in the administrative practices of head teachers in public primary schools in Edo state based on gender;
- find out if there is any significant difference in the administrative practices of head teachers in public primary schools in Edo state based on age;
- determine if there is any significant difference in the administrative practices of

head teachers in public primary schools in Edo state based on qualification

## 2. Methodology

The study adopted a survey design of correlational approach. This is because the descriptive survey will enable the researcher to collect information from a sample of a specified population. The design was considered appropriate for this study because the purpose of the study was to determine if demographic variables had influence on head teachers' administrative practices in public primary schools in Edo state. The target population consist all public primary school head teachers in Edo State. The sample of this study comprised 104 head teachers from 104 primary schools. Multi stage sampling technique was used to select the subjects for the study. In stage 1, the state was stratified into three senatorial districts of Edo State namely: Edo South, Edo North and Edo Central.

In stage 2, approximately ten percent (10%) of public primary schools were randomly selected each of the senatorial districts using the simple random sampling technique which was fifty (50) public primary schools from Edo South senatorial District, thirty-one (31) public primary schools from Edo North Senatorial District and twenty-three (23) public primary schools from Edo central senatorial district. in stage 3, pick each of the head teacher from the selected primary schools. The instrument for data collection was a structured Questionnaire titled: "demographic variables as determinants of head teachers' administrative practices questionnaire (DVDHTAPQ)". To ensure the reliability of the instruments, the Cronbach's alpha statistics was utilized to establish the consistency of the research instrument that was administered. To do this, 20 questionnaires were administered to head teachers in the primary school which were not part of the study and the result of the reliability test was 0.85. Research question 1 was answered using mean, standard deviation and rank order. Hypotheses were tested using independent T-test statistics at 0.05 level of significance.

## 3. Presentation of Results

**Research Question 1:** What are the common administrative practices of head teachers in primary schools in Edo state?

**Table 3:** Mean and standard deviation scores on the common administrative practices of head teachers in primary schools in Edo state

S/N	Item	N	Mean	SD	Rank
1	Instructional Management	104	3.16	0.42	1st
2	Staff personnel administration	104	2.63	0.91	6 <sup>th</sup>
3	Student personnel administration	104	2.81	0.72	4 <sup>th</sup>
4	School plant management	104	2.81	0.39	4 <sup>th</sup>
5	Financial management	104	2.88	0.42	3 <sup>rd</sup>
6	School-community relations	104	2.91	0.33	2 <sup>nd</sup>

N=104, Mean score less than 2.50 is disagreed, while 2.50 and above is agreed, SD: standard deviation, significant mean is  $\geq 2.50$

Data in Table 3 showed the descriptive data of the common administrative practices of head teachers in primary schools in Edo state. All the indices of head teachers' administrative practices according to the analysis had mean values ranging from 2.63 – 3.16 and standard deviation ranging from 0.33 – 0.91 respectively.

Since the mean of instructional Management is higher than the other, it can be concluded that the instructional Management is the predominant administrative practice of head teachers in public primary school in Edo State.

### Hypothesis one

There is no significant difference in the administrative practices of head teachers in primary schools in Edo state based on gender

**Table 2:** t-test of administrative practices of head teachers in public primary schools in Edo state based on gender Headteachers

Gender	N	Mean	SD	df	t-value	p-value	Decision
Male	46	43.31	1.69	102	1.298	0.197	not significant
Female	58	42.90	2.10				

Not significant at  $p > 0.05$

The data in Table 2 revealed that the mean of administrative practices of male head teachers was 43.31 while that of female head teachers was 41.27. This means that male head teachers had higher performance in their administrative practices than their female counterparts; the table also shows that the difference in the administrative practices between male head teachers and female head teachers was not significant since t value of 1.298 at  $df = 102$  and p value of 0.197. Thus, there is no significant difference in the administrative practices of head teachers in public primary schools in Edo state based on gender

### Hypothesis two

There is no significant difference in the administrative practices of head teachers in primary schools in Edo state based on age

**Table 3:** t-test of administrative practices of head teachers in primary schools in Edo state based on Age

Headteachers' Age	N	Mean	SD	df	t-value	p-value	Decision
Below 40 years	2	40.00	0.00	102	-2.342	0.021	significant
40 years & Above	102	43.1	1.91				

significant at  $p < 0.05$

The data in Table 3 revealed that the mean of administrative practices of head teachers below the age of 40 years was 40.00 while that of head teachers of 40 years and above was 43.18. This means that head teachers of age 40 years and

above had higher performance in their administrative practices than head teachers below the age of 40 years; the table also shows that the difference in the administrative practices between head teachers whose age is below 40 years and head teachers whose age is 40 years and above was significant since t value of -2.342 at df = 102 and p value of 0.021. Thus, there is a significant difference in the administrative practices of head teachers in public primary schools in Edo state based on age

### Hypothesis three

There is no significant difference in the administrative practices of head teachers in primary schools in Edo state based on qualification

**Table 4:** t-test of administrative practices of head teachers in primary schools in Edo state based on Qualification

Qualification	N	Mean	SD	df	t-value	p-value	Decision
NCE/B.Sc.(Ed)	74	42.66	0.56	102	-2.294	0.024	significant
PGDE/M.Ed/MSc.	30	41.93	0.52				

Significant at  $p < 0.05$

Data in Table 4 revealed that the mean of administrative practices of head teachers who hold NCE/B.Sc.(Ed) was 42.66 while that of head teachers who hold PGDE/M.Ed/MSc was 43.18. This means that head teachers with higher qualifications had higher performance in their administrative practices than head teachers with lower qualifications; the table also shows that the difference in the administrative practices between head teachers with lower qualifications and head teachers with higher qualifications was significant since t value of -2.342 at df = 102 and p-value of 0.021. Thus, there is a significant difference in the administrative practices of head teachers in public primary schools in Edo state based on educational qualifications

### 4. Discussion of findings

The common administrative practice of head teachers in public primary schools in Edo state is instructional management. Although the head teachers engage in other administrative practices like personnel administration (staff and student), school plant management, financial management and school-community relations management, it is not as common among them as they carry out instructional supervision. The reason could be that the head teachers are aware that the main strategy that could lead to administrative success in the school system is the effectiveness and efficiency of instructional supervision. This validated the claim of Haruna (2008) that instructional management is the first and the most important responsibility of a school head teacher. This study is in agreement with Adeniyi and Omotoso (2014) who categorized principals' and head teachers' administrative practices or behaviours as instructional management, personnel administration (staff and student), school plant management, financial management and school-community relations

management. This study is also in agreement with Mgbodile (2004) who grouped head teachers' administrative practices or behaviours about school administration into six broad areas namely: school-community relationship, curriculum and instruction, pupil personnel, staff personnel, physical facilities, equipment and business management.

The findings from hypothesis one revealed that there was no significant difference in the administrative practices of head teachers in public primary schools in Edo state based on gender. This could be because the male and the female headteachers are conversant with their roles as the administrative head of the primary school system and as such strive to put in their best in their duties to succeed in their leadership roles to portray themselves as good examples for their subordinates to emulate. This finding conformed to the findings of Ekere (2021) who found that there was no significant difference between male and female principals in the utilization of legal provisions in secondary school administration in Cross River State, Nigeria. This study is in line with Nwaribeaku, Francis, Nwamaka and Nwakaegohis (2021) whom in their study revealed that there was no significant difference between male and female principals on their utilization of mandatory school records in secondary school administration in Anambra State.

The findings from hypothesis two revealed that there was a significant difference in the administrative practices of head teachers in public primary schools in Edo state based on age. One possible explanation for this is that young head teachers are open to new ideas and are more dynamic in performing their administrative tasks thereby adapting easily to the changes in administrative practices as a result of the dynamic nature of the world. Also, the significant difference observed could be because the older head

teachers are more experienced in carrying out their administrative tasks and more effective in their duties since experience comes with age. The result of this study supports the findings of Onubuleze (2018) who found that there was a significant difference in the performance of principals in the task areas of management of secondary education in Nsukka Education Zone based on their ages. However, this study disagrees with the findings of Batool, Sajid, Khattak, and Saleem (2016) who found no significant difference in the impact of conflict management style at the secondary school level based on the principal's age

The findings from hypothesis three revealed that there was a significant difference in the administrative practices of head teachers in public primary schools in Edo state based on qualification. This could be because head teachers with higher are more exposed academically and pedagogically as a result of more training and education that they have acquired over time. This finding agrees with the findings of Walson and Vita-Agundu (2023) who found that there was a significant difference in principals' performance in the management of senior secondary schools in Rivers State based on their qualifications. However, the finding of this study disagrees with the finding of Mohammed, Edu and Etoh (2020) who found no significant difference between principals' educational qualification and their administrative competence in senior secondary schools in Lagos State.

### 5. Implication for Educational Administration

Primary school education serves as a child's first introduction to the world of education, a world which would dominate and shape their lives in the subsequent years. A child's economic and social success is determined to a significant extent by how well he or she performs in school during the first critical years under the guidance of the teachers. These teachers in turn are supervised by the head teachers. Its goals therefore cannot be fully achieved if primary schools are not effectively and efficiently administered and supervised by the head teachers. It is therefore important that school administrators should adequately perform their administrative tasks effectively regardless of their gender, age or educational qualification so that the objective for which the primary school education was established can be achieved.

### 6. Conclusion

Based on the findings of this study, it was observed that the common administrative practice of head teachers in public primary schools in Edo state is instructional management; there is no significant difference in the administrative practices of head teachers in public primary schools in Edo state based on gender. There is a significant difference in the administrative practices of head teachers in public primary schools in Edo state based on age and qualification.

### 7. Recommendations

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

- The head teachers in public primary schools in Edo state should be dynamic in adopting their administrative practices to improve the school's effectiveness in the state
- Gender should not be considered as a factor when appointing head teachers in public primary schools because gender does not have significant influence on the administrative practices of head teachers in public primary schools in Edo state
- Age should be considered as a factor when appointing school head in public primary schools in Edo state because experience increases with age and the experience can make a difference as the head of the school system.
- Educational Qualifications should be considered as a factor when appointing school administrators in public primary schools in Edo state because administrators with higher academic qualifications tend to perform better in the position of leadership due to their academic exposure.

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## Personnel Labour union Characteristics and Effectiveness of School Management in South-West Secondary Schools Nigeria

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**Abstract.** Personnel in organisations such as the school, belong to labour union where they strive to assert their rights. The study investigated the various characteristics exhibited by school teachers in their labour union (Nigeria Union of Teachers) and their influence on the effectiveness of the school management in South West secondary schools, Nigeria. The study adopted the descriptive survey design. The population of the study consisted 10, 211 teachers from which the sample size of 384 teachers was selected based on the Taro Yamane formula. A researcher constructed questionnaire “Personnel Union Characteristics and School Managers Effectiveness Questionnaire” (PUCSMEQ) was used for the study. The research questions were answered in mean and standard deviation, using 2.5 as the acceptable benchmark mean while the hypotheses were tested with chi –square at 0.5 Level of Significant. The findings indicated that the teachers engaged in various union activities such as rallies, display of grievances resulting in strike actions. Also, it was found that the teachers’ union activities, mostly strikes, significantly influenced school management effectiveness of prompt realisation of learning goals. Recommendations such as having the policy of teachers prioritising their primary duties over union activities and management democratic behaviour on union matters were proffered.

**Keywords:** Personnel, Labour union, characteristics, effectiveness, school management, teachers, principals

### 1. Introduction

In all organisations, to which the school belong, there exist the personnel and the management in tackling administrative duties and services. In order to fully enjoy a smooth working relations, personnel tend to

belong and adhere to labour union principles and tenets (Agbaru, 2012). The participation of personnel especially teachers in labour union such as the Nigeria Union of Teachers (NUT) in secondary schools, necessitate the need for effective management of schools (Manju, 2014). The management skill of school managers bears more on teachers’ labour union characteristics. Personnel labour union characteristics such as those of the teachers are the various behavioural traits the teachers exhibit in the course of belonging to the labour union. Personnel Labour characteristics according to Tongo & Osabuohien (2007) are the total range of behaviour and attitudes that employees in organisation express that are often of disapproval with the management but of immense benefit to the personnel. As the teachers engage in their NUT activities, most of the union characteristics exhibited by them in schools revolve round attendance of union meetings, charting courses for their progress, union road shows, and enacting policies for their welfare. The teachers being fully aware of the benefits of active participation in union activities, strive at all cost to be regular and vibrant.

In the South West secondary schools, the school management and the teachers appeared to be in regular altercation as a result of their labour union involvement. These union characteristics seemed to have influence on the effective management of schools (Agwobike, 2004). School principals’ management techniques are the various approaches, styles employed by the principal in discharging their duties in relation to the personnel assigned to them. It entails the modus of relating with the staff for full realisation of the goals and objectives of school performance (Amadi, 2013). Therefore, for effective management the principal as the school manager should strive to combine good interpersonal relationship skills with various elements of management to create conducive

environment towards high academic attainment. Thus, effective school management as it relates to school principals, involve adequate academic planning, coordination of staff responsibilities, regular supervision, strict accountability, better communication skills and cordial community relations in order to achieve the set education goals. School managers such as the principals and other relevant school management personnel make it as their priority to create the enabling environment for staff to feel the impact of their administrative techniques. This they do through strategic delegation of duties and prompt supervision to ensure accountability.

Teachers in the South West schools, view their enrolling in the NUT as being compulsory and not negotiable. Every teacher upon appointment automatically joins the union. In Lagos State the teachers are highly involved in the labour union activities. They have their biannual meetings, lecture series, road map shows, seminars and various fora to enhance their teaching career. The union also ensure that staff are up dated through monthly bulletin. This has necessitated the teachers' frequent unions' engagement as they belong to various sub committees to obtain the full benefits of being NUT member. In a similar trend, the teachers in Ogun State are known for their active labour union engagement such that the principals as the school managers tend not to be too comfortable with the teachers. The principals see the teachers numerous NUT engagements as impediment to their teaching duties (Peretomode, 2007). That teachers are immensely absorbed in their union obligations cannot be over emphasised as it relates to the schools in Ogun State. Teachers' passion for union activities stemmed from the facts of not being left behind when account of active participation in union activities are taken annually. The NUT various activities such as annual conference, staff development seminars, welfare cooperative meetings often compete with the class activities of the teachers. The never-ending union activities of teachers have made most school principals in the state to re-strategise their managerial skills in order for teaching/ learning not to be affected. According to Kamoh, Ughili & Abada, (2013) the union activities of personnel might not augur well for effective management, hence there is need for teachers' use of prerogative of duties to meet their teaching obligation. The authors in their report viewed active participation of teachers in union activities as a distraction to their daily classroom teaching. Most teachers who are union executive seemed to prioritise the union engagement over their primary duties of teaching.

As part of personnel labour union characteristics, the teachers in the south west secondary schools are often at variance with the school management principles in order to obtain the maximum benefit from their employers. It is a non-disputable fact that management will always maximise interest to the detriment of employees in labour relations (Wigwe, 2014). Labour union the world over such as the NUT aimed at addressing their workers needs for better welfare. In addressing their employees' needs as the union stipulates, most union leaders would more often than not try to be technical with their own side of the bargain. Labour union leaders such as the NUT in the South-West schools feign ignorant of their own service to the teachers due to selfish gains (Ukachukwu, Iheriohama & Nwokorie, 2017). They seemed to neglect their managerial functions to the teachers despite frequent reminder in order to maximise their interest. The teachers who are the principal beneficiaries of the school managers' neglect express their concern through various segments. The school teachers often express their grievances as a major characteristic of school personnel in the South West schools, through the NUT. As a fall out, the NUT executives more often than not register the teachers' agitations with the school management in areas relating to their work interest.

Majority of teachers grievances to the school management which in turn are channeled to the government are based on adequate welfare packages for teachers (Alabi, 2002). Personnel in the South West Schools have been forced to express their grievances in various forms. In 2017, Lagos State teachers voiced out their reservations on the sharing formula of the eko project. This they did through series of complaint letters, boycotts, meetings and project sharing formula initiatives. This form of grievances no doubt hinge on the school management effectiveness as most NUT executives were agitated at work. In Oyo State the teachers express their objections over the non-payment of 2018 leave grant, delay in promotion of staff and in payment of salary. The teachers and the executives in their characteristic manner engaged the school management and the government through series of meetings, deadline letters, rallies and protests match to drive home their demands. Also, most NUT executives in Ife metropolis, Osun State expressed their grievances on the government refusal to implement the new minimum wage in 2019. This they did through Walk outs, meetings and deadline that almost paralyse the school activities in the state. It is of utmost importance that employees register grievances according to Foong & Loke (2011), these grievances are often inimical to management panache.

More often than not employee grievances characterised with complaint letters, deadlines, protests snowballed into full blown strike when not nibbed in the bud. This scenario of labour union characteristic according to Ukachukwu, Iheriohama & Nwokorie (2017) is played out between NUT and the government through the school management in the South west Schools. The strikes in the school lead to shut down of teaching and learning activities as the schools are totally closed. In 2009, the schools in the South west joined the national NUT strike as they protest the non –implementation of the harmonised Teachers Salary Scale. This strike had wanton influence on the school management effectiveness. The principals had to shut down schools with incomplete syllabus. Their interpersonal relations with the teachers drastically changed to a sterner measure while goals were left unachieved. There might be handicapped on accounting purposes as budget had to be revisited to accommodate the time loss. The managerial effectiveness of school principals seemed to have been influenced in the wake of different strikes characterising the fight for minimum wage increase in the South West schools. Oyo and Osun state at intervals were involved in more than 10 weeks strike respectively. As learning activities were paralysed in the state, the school managers were overwhelmed with pressure from most stake holders. They were forced to play down on essential management duties in order to win the angry teachers trust at negotiation meetings. The principals had to adopt the transactional style of carrot and steak to win the teachers back to the classroom. Also at resumption, the sterner techniques were used to enable the teachers gain the time loss for the students. Thus, the labour union characteristics of the teachers through NUT call for a critical look on the principal managerial effectiveness in the South West secondary schools.

### 1.1 Statement of the Problem

The certainty of personnel labour union and management relation, called for the display of the employee characteristics as experienced with the NUT in the South West secondary schools. The teachers display characteristics such as NUT engagements in meetings attendance, conferences; registering grievances in deadline issuance, protests, lock out and the full-blown strike if not curtailed. These labour union characteristics do not occur in a vacuum, the school management such as the principals bear the brunt as they strive for effectiveness (Amadi, 2013).

The school principals in attempt to be effective in management must be proactive in planning, coordinating, supervising and cultivate better

interpersonal relation techniques to realise the academic goals. These management effectiveness skills aimed at achieving school learning goals by the principals are somewhat influenced by the teachers' labour union characteristics.

The cordial interpersonal relation between the school principals with the teachers appeared to be strained as the teachers engage in union activities through travelling for conferences, seminar to the detriment of their assigned teaching duties. The principals would have no objection than to use stern measures of warning, query letters that might hinder high productivity (Okorie, 2002). On the other hand, the grievances registered by teachers as they press their demands often result in delay in discharging duties; thus, making principal planned schedules to be scuttled by not meeting up the planned duties time line. The rallies and lock down seemed to influence the management effectiveness as the students, parents and community see the principals as being inept in conflicts management.

There appeared to be major management effectiveness melee when the teachers' grievances result in strike action (Francis & Oluwatoyin, 2019). When the schools are shut down the management knack of the school principals are influenced, there cannot be smooth managerial efficiency under tense chaos atmosphere with the teachers. The school principals have to carve out time to join government in negotiation through meetings with the teachers. As the strike is called off after much pressure on the principals' tact, the school time table had to be changed while the goals of teaching are seldom achieved. The course content might not be completely taught as the principal resort to being autocratic due to stress factors in coercing the teachers to perform their duties. This strain in the teachers' /principals' relation often led to adverse behaviour bothering on trust and submission in school organisation. Thus, the teachers' labour union characteristic through the NUT might necessitate that the school principals' managerial effectiveness be appraised. It is against this background that the study sought to investigate the school teachers' labour union characteristics and the school principals' management effectiveness in South West secondary schools Nigeria.

### 1.2 Objectives

The study sought to:

- ascertain the frequency of teachers' engagement in union activities
- investigate the method used by teachers in expressing their grievances

### 1.3 Research Questions

The following research questions were raised to guide the study:

- To what extent do teachers involve in union engagements in the schools?
- How do teachers express their grievances to the school management?

### 1.4 Hypotheses

- Teachers' engagement in union activities will not significantly influence management effectiveness in the schools.
- Strike action of teachers will not significantly influence management effectiveness in the schools

## 2. Methodology

The study utilised the descriptive survey design. The population consist all the secondary schools in the South West region of Nigeria. There are six states in the region, the stratified sampling technique was used to select three states for the study. There are 322, 123 and 119 number of secondary schools in the selected states respectively with 10,112 teachers. The Taro Yamane formula was used to get the sample size of 384 teachers for the study. A researcher constructed questionnaire "Personnel Union Characteristics and School Managers Effectiveness Questionnaire" (PUCSMEQ) was used for the study. The research questions were answered in mean and standard deviation, using 2.5 as the acceptable benchmark mean. The hypotheses were tested using chi –square at 0.5 Level of Significant.

## 3. Analysis of Data

**Research Question 1:** To what extent do teachers involve in union engagements in the schools?

**Table 1:** Teachers Involvement in Union Engagement

S/N	Statement	Mean	SD
1	Teachers attend union meetings regularly	3.67	1.31
2	Teachers only attend annual union meetings	2.37	1.02
3	Teachers religiously participate in seminars organised by the union	3.56	1.14
4	Teachers in different union subcommittee are more active	4.12	1.21
5	Executive union members often travel for union activities	4.23	0.91
6	Activities of union are more tasking to the executive	2.98	0.96
7	Teachers seldom attend union activities	1.97	1.01
8	Union engagements do not overwhelm teachers	2.24	0.91
	Grand Mean	3.14	1.06

Table 1 shows the mean and standard deviation of the participants' responses on teachers' involvement in union engagement. The responses indicate that the teachers attend meetings regularly, participate in seminars, are active in subcommittees and travel for union activities. The grand mean (3.14) is greater than the benchmark mean (mean=2.5) therefore it can be inferred that the teachers are to a greater extent deeply involved in union engagements.

**Research Question 2:** How do teachers express their grievances to the school management?

**Table 2:** Expression of Teachers' Grievances

S/N	Statement	Mean	S D
1	Letter of complaint	3.64	1.12
2	Ultimatum letter	3.03	1.03
3	Awareness meetings	2.73	0.97
4	Executives emotional outburst	2.13	1.11
5	Protest rallies	2.79	1.02
6	Warning strike	3.76	1.09
7	work to rule	2.31	1.05
8	Lockdown	3.84	1.13
Grand Mean		3.02	1.06

Table 2 shows the participants' responses on modes of grievances expressed by teachers as union members. Their responses indicate that the teachers express their grievance mostly through Lockdown (3.84), warning strike (3.76), letter of complaint (3.64) and ultimatum letter (3.03). Other measures such as protest rallies (2.79), awareness meetings with teachers (2.73), work to rule (2.31) and emotional outburst of executives (2.13) are less frequently expressed. The grand mean (3.02) is greater than the benchmark mean (mean=2.5) therefore it can be inferred that the teachers really express their grievances to the school management through various labour behavioural antics.

**Hypothesis 1:** Teachers' engagement in union activities will not significantly influence management effectiveness in the schools

**Table 3:** Teachers' Engagement in Union Activities and Management Effectiveness

Variables	Mean	SD	N	df	a	X <sup>2</sup>	P-value	Remark
Teachers' Union Activities	54.6	14.5	384	382	0.05	60.39	0.01	Sig
Management Effectiveness	64.6	16.4						

N= no of observation, df = degree of freedom, α =level of significance, x<sup>2</sup>=chi square.

Table 3 shows the result of the test of hypothesis on the influence of teachers' engagement in union activities on the management effectiveness in the schools. The hypothesis is significant as the p- value (0.01) is less than the 0.05 level of significance (x<sup>2</sup>= 60.39, df=382, P-value=0.01 <0.05). Thus, the null hypothesis is rejected and the alternative taken. This implies that teachers' engagement in union activities significantly influenced management effectiveness in the schools.

**Hypothesis 2:** Strike action of teachers will not significantly influence management effectiveness in the schools

**Table 4:** Teachers' Strike Action and Management Effectiveness

Variables	Mean	SD	N	df	a	X <sup>2</sup>	P-value	Remark
Teachers' Strike Action	57.3	13.5	384	382	0.05	60.39	0.01	Sig
Management Effectiveness	64.6	16.4						

N= no of observation, df = degree of freedom, α =level of significance, x<sup>2</sup>=chi square.

Table 4 shows the result of the test of hypothesis on the influence of teachers' strike action on management effectiveness in the schools. The hypothesis is significant as the p- value (0.01) is less than the 0.05 level of significance (x<sup>2</sup>= 60.39, df=382, P-value=0.01 <0.05). Thus, the null hypothesis is rejected and the alternative taken. This implies that teachers' strike action significantly influenced management effectiveness in the schools.

#### 4. Discussion of Findings

The participants' responses showed that the teachers are very much engaged in their labour union activities. These activities include regular meetings attendance, annual reunion, seminar at all levels, subcommittee meetings, distance travels by executives and negotiation meetings. That the teachers as school personnel are deeply engaged in union activities with a high mean of 3.14 is understandable considering the fact that the teachers must adhere to their union (NUT) regulation and policies through active engagement (Dauda, 2006). If teachers as school personnel are actively engaged in their union activities, then the tendency is for them to align their priorities and energy towards the improvement of their welfare. The teachers in the South- West schools in a bid to register their grievances towards school management and the government as showed in the data analysed get involve in awareness meetings, protest rallies, road show, ultimatum letter, warning strikes and lockdown. Among the modes of grievances displayed by the teachers, lockdown, warning strike and ultimatum letter ranked highest in intensity of usage. That lockdown and warning strikes are more often displayed as grievances by teachers through their union according to Manju (2014) amount to the delay in the management interference. The author opined that the fact that the teachers' agitations snowballed into strike sufficed that the management through the government do not harken to the teachers' initial grievances. This is understood as the school management regard the initial agitations through protests, ultimatum as mere threat till the major lockdown through strike which is perceived as the final straw, is established. The NUT therefore uses the strike as the major blow or last resort that can spur the school management to hearken to the union agitations.

The findings further showed that the hyperactive engagement of teachers in their union activities in the South- West schools such as meetings, rallies and seminars attendance significantly influence the school management effectiveness. That teachers spent some part of their primary duties assignment time on union engagement, more often than not result in principals' non-attainment of some learning goals. Personnel active engagement in union activities compete with teachers' classroom activities. Most teachers prefer to obtain permission from their principal for union meetings rather than be in the classroom. This sometimes results in administrative lapse on the part of the school principals. The lapses experienced by the principals might lead to managerial ineffectiveness according to Amadi (2013) due to teachers' unfinished syllabus and unfulfilled teaching goals. Okoro (2004)

in analysing teachers productivity opined that the effective management skills aimed at achieving school learning goals, prompt syllabus completion and impactful teaching are often affected due to teachers' regular union activities. The teachers' engagement in union activities do compete with the quality of their primary duties, which in turn bear on the principals' managerial technique as they juggle to meet the initial time line. In attempt to balance the equation and avoid negligence of duties, the teachers' classroom teaching suffers.

In another vein, the findings showed that the teachers' grievances often result in lockdown and strike actions. This strike action according to the findings do influence the school management effectiveness. This result of the findings is in line with Ukachukwu Iheriohama & Nwokorie (2017) that when strike occur the principal managerial skills are greatly influenced as they try to juggle schedules in making up for the time loss. The principals are always left alone in the schools when the teachers are in lockdown through strikes. They are challenged with non realisation of planned objectives, abrupt end to students learning, delay in students' examination, results, and completion of the school calendar. No school manager would want goals to be unaccomplished as experienced during teachers' union strike as academic activities would be shut down. Strike therefore as a weapon to make school management bend to the teachers' demands through their union often results in the school management ineffectiveness. The school management according to Oboegbulem (2004) must be proactive in quelling teachers' agitations at the initial stage. An effective school principal according to the author should liaise with the aggrieved personnel to forestall hitches when grievances are registered. The influence of strike on the principal managerial skills do result in changes expressed in supervisory and interpersonal relationship techniques with the teachers. This is so when the agitations of the teachers are met and classes resume. The principal must try the best strategies at utilising stringent measures to ensure gain of the time loss.

#### 5. Conclusion

The school as an organisation provide enabling environment for the personnel; who as teachers strive for their rights through the NUT, its labour union. In order to fully enjoy a smooth working relations, personnel tend to belong and adhere to labour union principles and tenets. The school teachers' personnel union characteristics such as meetings, rallies, protests and lockdown are often exhibited by the teachers as a

means to maintain their NUT policies and principles. In the schools as all organisations strategise, the school management as the principal ensure teachers promptly discharge their respective duties. In the South- West secondary schools, the school management and the teachers appeared to be in regular altercation as a result of their labour union involvement (Agwobike, 2004). School principals' effective management of prompt realisation of learning goals aimed at maintaining high students' academic standard is often influenced through the teachers' labour union characteristics. The teachers display of grievances mostly through strike more often than not scuttle the management laid down objectives as they struggle to apply alternative management/personnel relationship techniques to get the teachers make up for the time loss after the strike.

## 6. Recommendations

The following were recommended for policy and practice to guide school management and personnel:

- The school management, principals should positively work and align with the teachers as they engage in their NUT labour functions to avoid friction when the teachers are to indulge in their labour engagement.
- There should be a policy guiding the school teachers as personnel to prioritise their primary duties in the school over their labour union engagement to ease tension.
- The school management should act as arbiter in the event of negotiation over school teachers' labour union demands to forestall stalemate resulting in strike.
- There should be a retraining programme for school management and personnel for onward enlightenment in handling labour union management faceoff.
- The school management should have in place the policy of alternate timetable for school teachers as they indulge in their labour union engagement.

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## Effectiveness of Project-Based Learning on Achievement in Basic Science among Private and Public Junior Secondary School Students: Implications for Evaluator

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**Abstract.** Project-based learning is a learner-centred teaching methodology that allows students to acquire key knowledge and skills through the development of projects that respond to real-life problems. Project-based learning has fast gained its popularity and benefits in Western climes, as one of the 21st century revolutionised teaching method. This study investigated the effectiveness of project-Based Learning (PBL) on students' achievement in basic science in public and private junior secondary schools in Ikeja Local Government Area of Lagos State. Quasi-experimental research design was used multi-stage sampling technique was used to select two hundred (200) junior secondary school students from four schools (two public and two private schools). Two research instruments were used for data collection: a self-constructed questionnaire titled: "Effectiveness of Project-Based Learning on Students' Achievement in Basic Science" (EPBLSABS), and Basic Science Achievement tests (BSAT). Three hypotheses were tested to guide the study at 0.05 level of significance. Findings from the study revealed that project-based learning (PBL) exerted a marked significant difference between the academic achievement of students taught Basic Science using project-based learning and those taught using traditional methods in both public and private junior secondary schools. Based on these findings, it was recommended that School teachers should ensure that they get up-to-date skills set on best practices of using project-based learning (PBL) in order to impart knowledge in Basic Science on their students. Also, school administrators, should take proper scrutiny of teachers to ensure that emphasizes and inclusion of project-based learning (PBL) techniques in their teaching lesson plans for robust learning of their students.

**Keywords:** Effectiveness, Project-based Learning, Achievement, Students.

### 1. Introduction

Teaching and learning is a continuous process. Commonly used teaching methods in Nigerian schools includes lecture, collaboration, demonstration, recitation, memorization, or combinations of these methods. 21<sup>st</sup> century teaching in schools have evolved into the using of some different new methods; some of which are Direct Instruction, Flipped Classrooms, Kinesthetic Learning, Differentiated Instruction, *Project-based learning*, Inquiry-based Learning, Expeditionary Learning, Personalized Learning, Game-based Learning Etc. Teaching approaches can be broadly classified into two. These are: teacher-centered and student-centered approaches. In a teacher-centered approach to learning, teachers are the main authority figure in this method, students are viewed to receive instruction from the teacher dogmatically and their primary role is to passively receive information (via lectures and direct instruction) with an end goal of testing and assessment. It is the primary role of teachers to pass knowledge and information's onto their students. In this method, teaching and assessment are viewed as two separate entities. Student learning is measured through objectively scored tests and assessments. Student-Centered Approach to learning is a process whereby teachers are the authority figure in this method, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. However, for a particular teaching method to be appropriate and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about.

21st century education, especially in this part of the world emphasize that students should continue to be educated in the same way as they were in the past, being taught with a standardized curriculum through

rote learning and individualized testing, as a one-size-fits-all pace. Far too many students are struggling to learn because they are disengaged and lack motivation. Kember (2017) described two broad orientations in teaching: the teacher-centred/content-oriented conception and the project based oriented conceptions. In a very useful breakdown of these orientations, he supports many other authors' views in relation to project-based learning, which includes that knowledge is constructed by students and that the teacher is a facilitator of learning other than a presenter of information.

Project-based learning is one of the modern student-centered teaching methods that engages students in acquiring knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks.

Larmer, in the Buck Institute for Education (2015), has summed up Project Based Learning (PBL)'s basic premise as a student led, open-ended authentic project that emphasizes the growth of knowledge and core competency skills like collaboration, creativity and critical thinking (Larmer, 2014). Condliffe (2016) defines PBL as an approach where students try to find solutions to an essential question that is based on a real-world challenge. This approach requires students to actively investigate and explore significant content and learn skills that are crucial to the process of inquiry to be able to answer the essential questions that will result in deeper learning through active exploration of real-world problems and challenges. Grant (2012) opines that PBL, is a student-centered learning where, learning is not a linear road of specific learner outcomes, but instead an open and flexible approach, where multiple subjects can cross. Through inquiry, students are able to collaborate and develop their own learning instead of being led by the teacher instruction. According to Demirhan (2022), project-based learning is a comprehensive approach to classroom teaching and learning that is designed to engage students in investigating a complex, authentic problems and carefully designed products and tasks. Omeje, (2014) opines that project-based learning is an instruction that comprises four components: Purposing, planning, executing and judging. This is seen as a means of teaching the students self-discipline; students have to define the problem, plan their work, find appropriate resources, carry out the plans and draw conclusion. It involves assigning a particular work to students or a group of students to work and compare at their spare time and report to the teacher as when demanded.

PBL is a process of learning whereby students learn through inquiry. Students pursue knowledge through reflecting and asking questions. In order for students to begin to ask questions, they must be intrinsically motivated in order for a reflection to occur. PBL requires critical thinking, problem solving, collaboration, and various forms of communication. To answer a driving question and create high-quality work, students need to do much more than remember information. They need to use higher-order thinking skills and learn to work as a team. Moursund (2015) opines that students have a voice and control over, how they "shape their learning to fit their own interests and abilities." This allows students to create content that may be more meaningful and memorable to the student, which begins to also suggest mastery learning. Rogers (2013) identified the important precondition for project method as the need for a leader or person who is perceived as an authority figure in the situation, is sufficiently secure within his/herself and in relationship to others that experiences an essential trust in the capacity of others to think and learn for themselves'. Choice in the area of the learning is emphasized by Burnard (2016), as he interprets Rogers' ideas of project method as 'students might not only choose what to study, but how and why that topic might be an interesting one to study'. He also emphasizes Rogers' belief that students' perceptions of the world were important, that they were relevant and appropriate. The definition therefore emphasizes the concept of students having 'choice' in their learning. Harden and Crosby (2011) describe teacher-centred instruction strategies as the focus of the teacher in transmitting knowledge, from the expert to the novice. In contrast, they describe project method as focusing on the students' learning and 'what students do to achieve this, rather than what the teacher does'. This definition emphasizes the concept of the student 'doing'.

Lea and Stephenson (2013) summarize characteristics of project method to include the followings tenets:

- Reliance on active rather than passive learning,
- Emphasis on deep learning and understanding,
- Increased responsibility and accountability on the part of the student,
- Increased sense of autonomy in the learner
- Interdependence between teacher and learner,
- Mutual respect within the learner teacher relationship, and
- Reflexive instruction to the teaching and learning process on the part of both teacher and learner.

According to Gibbs (2015), PBL draws from similar concepts when he describes project method courses as those that emphasize: learner activity rather than passivity. Students' experience on the course outside the institution and prior to the course; process and competence, rather than content; where the key decisions about learning are made by the student through negotiation with the teacher. Gibbs elaborates details on these key decisions to include: What is to be learnt, how and when it is to be learnt, with what outcome, what criteria and standards are to be used, how the judgments are made and by whom these judgments are made? In a similar vein, Harden & Crosby (2011). In their book for use in second level education (post-primary), entitled 'A Guide to Student-Centered Instruction', they present the main principles of project method as:

- Learner has full responsibility for her/his learning.
- Involvement and participation are necessary for learning
- Relationship between learners is more equal, promoting growth, development becomes a facilitator and resource person
- Learner experiences confluence in his education (affective and cognitive domains flow together)
- Learner sees himself differently as a result of the learning experience

Project-based learning is an educational activity in which a group of students working together during a period of time, receive instruction and feedback from an instructor, work an assignment or (practical) problem, acquiring knowledge, skills and attitudes (Baert, Beunens, & Dekeyser, 2022). Project-based learning is an instructional method centred on the learner. Instead of using a rigid lesson plan that directs a learner down a specified part of learning outcome or objectives. Project-based learning allows in-depth investigation of a topic (Erdem, 2022; Harris & Katz, 2021). Project based learning actively engages in problem solving learning process through planning, doing and completing projects. The new teaching paradigm embraces the belief that children learn best by applying concept to real world scenarios. (Chard, 2021). The Chinese philosopher, Confucius stated this concept concisely "I hear and I forget, I see and I remember, I do, and I understand". It is through this process that the brain gains understanding and assimilation of the lesson being learned and retains the understanding of that lesson at a higher rate than traditional classroom, single – topic instruction. Project – based learning is considered to be revolution in education, replacing out dated passive learning model of single topic study with active learning using "multiple – intelligence." Project-based learning offers a wide range of benefits to both students and teachers. A growing body of academic research supports the use

of project-based learning in school to engage students, cut absenteeism, boost cooperative learning skills, and improve academic performance. For students, benefits of project-based learning include:

- Increased attendance, growth in self-reliance, and improved attitudes toward learning (Thomas, 2020)
- Academic gains equal to or better than those generated by other models, with students involved in projects taking greater responsibility for their own learning than during more traditional classroom activities (Boaler, 2022)
- Opportunities to develop complex skills, such as higher-order thinking, problem-solving, collaborating, and communicating (Intel, 2013)
- Access to a broader range of learning opportunities in the classroom, providing a strategy for engaging culturally diverse learners (Railsback, 2022)

For many students, the appeal of this approach to learning comes from the authenticity of the experience. Students take on the role and behaviour of those working in a particular discipline. Whether they are making a documentary video about an environmental concern, designing a travel brochure to highlight sites of historical significance in their community, or developing a multimedia presentation about the pros and cons of building a shopping mall, students are engaged in real-world activities that have significance beyond the classroom.

For teachers, additional benefits include enhanced professionalism and collaboration among colleagues, and opportunities to build relationships with students.

Rogus (2021) asserts that students may not be challenged to gain a deeper understanding of what is learnt or to apply the content to real situation without actively engaged in the activities. By assigning a project or task to students to accomplish, it empowers them to learn outside the classroom lessons and develop contextual situation in which they can transfer the knowledge. With the above principles, project-based learning will be very effective for teaching acquisition of skills and practical skills as applicable in Basic Science.

Project-based learning, according to Biajone (2015), is a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks. Gulbahar and Tinmaz, (2014) in their study asserted that project-based learning can

produce positive attitudes towards students learning process, work routines, abilities in problem-solving and self-esteem. This implies that project-based learning is a method through which the teacher can promote students' positive attitude, interest, achievement and retention in learning. This is why the researcher advocates that project-based learning will be a suitable instructional method for JSS Basic Science.

With project-based learning children are exposed to a wide range of skills and competences such as collaborations, project planning, decision making, and time management (Blank, 2021, Dickinsen 2022). Project-based learning also increases motivation. Teachers often note improvement in attendance, more class participation and greater willingness to do homework (Bottoms and Webb, 2022; Monursund, Dielefeldt, and Underwood, 2021). It also helps students retain more knowledge and skill when they are engaged in stimulating projects. With projects, kids use higher order thinking skills rather than memorizing facts in an isolated context without a connection to how and where they are used in the real world (Blank, 2021; Bottoms & Webb, 2022; Reyes; 2022).

Through collaborative learning, PBL allows students to bounce ideas of each other, voice their own opinions, and negotiate solutions and skills that will be necessary in the work place (Bryson, 2020; Reyes, 2022). It enables students to make and see connections between disciplines, increase social and communication skills and provides opportunities to contribute to their school community. It enables children take pride in accomplishing things that has value outside the classroom and allow children to use their individual strengths and diverse approaches to learning (Thomas, 2022). It also provides a practical, real-world way to learn and to use technology (Kadel, 2022; Moursund, Dielefeldt, & Underwood, 2021), and increase problem solving skills (Moursnud, Dielefeldt & Underwood, 2021).

With many changes occurring in the field of education, why is PBL being called upon to help drive the new era of learning? According to the Buck Institute for Education (2015), research shows that learners not only respond by feeding back information, but they also actively use what they know to explore, negotiate, interpret, and create. They construct solutions, thus shifting the emphasis toward the process of learning. In addition, cognitive research has revealed much more about the nature of problem solving. Educationists have benefited from this research, as teachers have learned how to effectively scaffold content and activities to amplify and extend the skills and capabilities of students. Secondly, the world has changed, and nearly all teachers, understand how the industrial culture has

shaped the organization and methods of schools in the 19th and 20th centuries, and they recognize that schools must now adapt to a new century. It is clear that children needs both knowledge and skills to succeed. This need is driven not only by work force demands for high-performance employees who can plan, collaborate, and communicate, but also by the need to help all young people learn civic responsibility and master their new roles as global citizens (Buck Institute for Education, 2015). In this sense, the need for educationists to adapt to a changing world is the primary reason that PBL is increasingly popular. PBL is an attempt to create new instructional practices that reflect the environment in which children now live and learn. And, as the world continues to change, so will teaching methodologies, based on this premise, is the perceived effectiveness of PBL as it is widely being explored as the best method for teaching science.

Science is the foundation upon which present day technological breakthrough is built upon. Nations all over the world including Nigeria are striving hard to develop scientifically and technologically. Onanuga (2015) defines science as an integral part of human society whose impact is felt in every sphere of human life, so much that it is intricately linked with a nation's development. Science is the theory upon which the technology is built, without science; there cannot be intuition for technology (Onanuga, 2015). Integrated Science, as it was previously called, is the foundation for the science subjects like mathematics, physics, Chemistry, Biology, Geography, Physical and Health Education. It also cuts -across many other fields of human study. Today, based on recent development in science and technology, integrated science is taught as Basic science in both public and private schools at Junior Secondary School level. The main reason for teaching basic science is that it widens the knowledge of the students in science, which enables them to appreciate the unity among science subjects. Furthermore, the recipients may gain the commonality of the approach to solve problems of scientific nature. According to the Odugbuni (2020), basic science enables students to be able to: observe carefully and thoroughly, report completely and accurately, organize information acquired, generalize on the basis of acquired information, predict as a result of the generalization, design experiments (including control experiments where necessary, to check predictions), use models to explain phenomena, where appropriate and continue the process of inquiry when new data do not conform to predictions.

The goal of science education according to Feinstein, (2021) is to help students become competent outsiders "with respect to science and

technology; that is, teach them how to recognize moments when scientific and technological information would be useful and enable them to locate, integrate with their own experiences, and reach an informed opinion or decision. He alleges that traditional education instead produces marginal insiders, whose scholastic experiences and rudimentary understanding of science often dampen their interest and impede their confidence in dealing with scientific information. To achieve these objectives, it is suggested that the teaching and learning of basic science should involve the use of innovative methods in teaching. Such methods are not limited to discovery, problem-solving, open-ended field trip and laboratory method among others.

Achievement is defined as a thing done successfully, typically by efforts, courage or skill. It is the process of actualizing something. Academic Achievement is described by Adeyemi, (2021) as the scholastic standing of a student at a given moment which states individual abilities. It refers to a person's learning ability which could be positive or negative performance. Academic achievement is used to measure a student's cognitive, affective and psychomotor domains. Students' academic achievement can be explained in form of grades obtained from tests or examination on courses taken. Academic achievement as described by Adeyemo, (2015) as the scholastic standing of a student at a given moment, which states individual abilities. Students' academic achievement can be explained in form of grades, obtained from tests or examinations on courses taken. In Nigeria, the level of students' academic achievement in junior secondary schools is determined through external examinations like Basic Education Certificate Examination (BECE) conducted by the Exam Development Centre (EDC) of the State. Achievement of instructional objective as explained by Utulu and Alonge (2022) showed that project-based learning actively engages students in the effective mastery of the subject matter and promotion of a positive attitude towards the subject. As noted by the ministry of Education in its National Report on the Development of Education in Nigeria, presented at the International Conference on Education in September 2001, teaching instructions adopted should make learning more learner-centered in order to promote imaginative, critical and creative skills in students. In a project-based learning class, students take a participative role by leading discussions and teachers become facilitators in this regard, teachers facilitate students' discussion and interject only when necessary, allowing students to put the language to use and explore aesthetics of learning materials (Oludipe and Idowu, 2021).

The achievement of the objectives of basic science depends largely on what the teacher does in the

classroom during the implementation stage. The teacher should adopt the most appropriate teaching method, skills and materials in promoting learning. The method adopted should be one that can enable the teacher present the lesson effectively and at the same time give students the maximum opportunity of participating actively in the learning process (Offorma, 2016). In recent times, emphasis on teaching methodology has shifted from the teacher-know-all to the student-centered approach. Hence educational activities should be centered on the learner for maximum self-development and fulfilment. Teaching is an art of creation and the product of this creation is the human personality. Teaching is a systematic activity deliberately engaged in by the teacher to facilitate the learning of the intended knowledge, skills and values by the student and getting the necessary feedback (Offorma, 2016). This calls for the introduction of a constructivist teaching method like project-based learning (PBL). Constructivist teaching is based on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction rather than passively receiving information. Project-based learning (PBL) is practical oriented and student-centered approach to teaching. It fosters critical thinking, problem solving and philosophy of learning by doing, which helps to motivate interest and enhance retention in subjects like basic science

Another factor which determines the academic achievement of students in basic science is the type of school (public owned or privately owned). Public and private schools are institutions owned as the names denote. The public schools in Nigeria have Federal, State, and Local Governments as their proprietors while the private schools have individuals, associations or organizations as the owners. The superiority of private schools and public schools remain an unending debate among scholars. Olatoye (2019) suggests that there exists a significant difference in mathematics and science achievement of public and private school pupils in which private school pupils performed better than their public-school counterparts. However, in a study comparing students' academic achievement in business studies in public and private Junior Secondary School Certificate Examinations (JSSCE) in Edo state, according to (Igbinedion (2021), it revealed that there was a significant difference in the academic achievement in business studies between public and private schools from 2018 to 2020. Results further showed that the percentage achievement trend of public schools was higher than those of private schools. These discussions so far, show that there is a need to investigate the effectiveness of PBL on private and public junior secondary school students' achievements in basic science.

## 1.1 Statement of the Problem

Basic science forms the foundation of other disciplines in science. It is a driving force for technological breakthrough and national development. Despite the already existing methodologies available to teaching of science, the state of science learning in Nigeria is still a concern to all and sundry. Teacher-centered methodology

seems obsolete and insufficient in teaching basic science and the evidence of this can be seen in the achievements in basic science among junior secondary school students. There has been an increasing concern about the overall academic achievement of public and private junior secondary school students in basic science, as measured by the Basic Education Certificate Examination (BECE). The table below further highlights this.

**Table 1:** Percentage of Passes and Failures at the BECE (in Basic Science) for a 4-Year Period

Year	Distinction	Credit	Pass	Fail
2016	10.2	21.1	41.5	27.2
2017	9.8	16.5	42.8	30.9
2018	5.4	14.7	38.6	41.3
2019	8.3	18.9	41.2	31.6
Average	8.43	17.80	41.03	32.75
Total Average	13.11	17.8	41.03	32.75

*D-Distinction, C-Credit, P-Pass, F-Fail*

*Source: Digest of Education Statistics, Federal Ministry of Education, 2020.*

The data in table one above showed that students' performances in basic science were more at the pass and failure grades than distinction and credit grades. Few percentages of the students made it at the distinction and credit level (13.11%) while the pass and failure grades amounted to 41.03% and 32.75% respectively within the review period. Since the quality of performances' decreases from distinction down to failure grades, it implied that the results were dismal. The poor academic achievement of students basically has largely been attributed to poor teaching methods adopted by the teachers as seen in several researches on achievement among others.

A look at the performance from 2016 to 2019 in the Basic Education Certificate Examinations shows that achievement targets have not been met. State public and private schools achieved an average performance of 50% in Basic Science, as against their target which was 69% (Global Delivery Initiative, 2019). Further, Osuolale (2014) in his study highlighted that the problems of teaching and learning of basic science in junior secondary schools in Nasarawa State originated from the poor foundation and ineffective teaching methods in Basic science. Some parents and other stakeholders in secondary education have argued that private schools have a more positive attitude towards intellectual development of students and therefore offer higher learning opportunities, experiences and various pedagogical practices to improve their students' performance and achievement in academics unlike the public schools. In the past, research efforts had been focused on identifying factors that militate against student's learning outcomes in Basic science. The manner in which the subject is presented to students can significantly influence their interest and knowledge. While the manner of presentation is supposed to be activity based, most Nigerian secondary school teachers rely

on expository lecture method. Specific challenges facing teachers include:

- Recognizing situations that make for good projects
- Structuring problems as learning opportunities
- Collaborating with colleagues to develop interdisciplinary projects
- Managing the learning process
- Integrating technologies where appropriate
- Developing authentic assessments

Teachers may have to be willing to take risks to overcome initial challenges. A supportive administration can help by implementing more flexible schedules, such as block schedules or team planning time, and providing teachers with professional development opportunities. Odugbuni (2020) pointed out that despite the thirty (30) years existence of learning style theories (detailing how people learn), most teachers still dispense information using traditional teaching methods without regard to student's learning abilities. These methods are theoretical, extremely didactic and teacher-directed, instead of being experimental or activity-based. It is for this reason that Onanuga (2015) recommended that schools, teachers, guidance counselors and other educational specialists need to employ a wider variety of teaching methods from modifying assessments and instructional strategies in the classroom to entirely redesigning the way in which students are taught in school. It is against this background that this study investigated the effectiveness of PBL on private and public junior secondary school students' achievements in science in Ikeja Local Government Area of Lagos state.

## 1.2 Objectives of the Study

The objectives of this study are:

- Determine the difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in public junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.
- Determine the difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in private junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.
- Determine the comparative effectiveness of project-based learning (PBL) on Basic Science achievement among public and private junior secondary school students within Ikeja Local Government Area of Lagos State, Nigeria.

### 1.3 Hypotheses

The following postulated research hypotheses guided the conduct of the study:

- There is no significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in public junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.
- There is no significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in private junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.
- There is no significant impact of the comparative effectiveness of project-based learning (PBL) on Basic Science achievement based on gender (i.e. gender difference) among public and private junior secondary school students within Ikeja Local Government Area of Lagos State, Nigeria.

## 2. Research Design

quasi-experimental research design, which is one of the quantitative research methods, was used to test

and compare the effects of PBL on achievement in Basic Science among students in public and private junior secondary schools in Ikeja Local Government Area of Lagos state.

### 2.1 Population of the Study

The population of this study comprises the adolescent students in junior public and private secondary schools in Ikeja Local Government Area. The total population projection of students between ages 12-14 years stands at 22,196. There are currently 13 public junior secondary schools in the Ikeja local government area, with 63 private junior secondary schools. JSSII students was used for the study, with a total population of 3,782 students in the public junior secondary schools and 1,168 students in private junior secondary schools within the Ikeja local government. (Lagos State School Census Report, 2019-2020)

### 2.2 Sample and Sampling Techniques

Multi-stage sampling techniques were employed in the study. A simple random sampling technique was used to select the four schools needed for the study. These four schools comprised of two public and two private schools within the Ikeja local government. Stratified sampling procedure was employed to select two hundred respondents from JSS II classes among the four selected secondary schools in the study area. Fifty students were selected from each of the four selected schools in Ikeja Local Government Area

### 2.3 Research Instrumentation

The two main instruments to be used in assessing the students' achievement in Basic Science are: A questionnaire titled: Effectiveness of Project Based Learning on Students' Achievement in Basic Science" (EPBLSABS) and a Basic Science Achievement Test (BSAT) compiled by the researcher from past questions of Junior Secondary School Basic Certificate Examinations. (2014-2019). the achievement test comprises of 20-multiple choice questions. These test items cover the topics that were treated during the term. The research instrument was validated by experts in the field of measurement and evaluation, who ensures the face and content validity, the instruments have a reliability of 0.82 for the questionnaires and 0.785 for the Basic- Science Achievement Test.

### 3. Results

#### Descriptive Analysis of Students' Demographics

**Table 2:** Demographic Information of the Students

Variables		Levels of Variables	No of Students (n)	Percentage (%)
School Name	Private Schools	School A	51	25.5
		School B	48	25.5
School Name	Public (Government) Schools	School A	51	25.5
		School B	50	25.5
		Total	200	100.0
Gender	Male		100	50.0
	Female		100	50.0
	Total		200	100.0
Age Group	12 years below		81	40.5
	13 – 15 years		118	59.0
	16 years above		1	0.5
	Total		200	100.0
School Type	Public (Government-Owned)		101	50.5
	Private		99	49.5
	Total		200	100.0

#### Hypotheses Testing

**Hypothesis 1:** There is no significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in public junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.

**Table 3:** Paired Samples *t*-Test (Dependent Samples *t*-Test) of Difference between Academic Achievement (Basic Science) of students taught using PBL and those taught using traditional teaching method in Public Junior Secondary Schools within Ikeja Local Government Area of Lagos State, Nigeria.

Modes of Item Construction	N	Mean	Std. Dev.	d.f.	t-cal.	Sig.(p) value	Decision
Achievement in Basic Science before PBL treatment (Pre-test)	101	12.03	1.81	100	23.597**	<0.001	Reject $H_0$
Achievement in Basic Science after PBL treatment (Post-test)		17.85	1.72				
Achievement in Basic Science before & after PBL treatment		5.82	2.48				

$p = < 0.001 < 0.01$

Table 3 revealed that there was an increase in the average academic achievement after the PBL treatment (i.e. in the post-test) as compared to their average academic achievement before the PBL treatment (i.e. in the pre-test), table 3 was more concerned with the meagre difference of 5.82 that emerged between the average academic achievement (before and after the PBL treatment) in the Basic Science.

This mean difference (5.82) in the average academic achievement before and after the PBL treatment was found to be statistically significant as it yielded a *t*-value of 23.597\*\* and a *p*-value that is  $< 0.001 < 0.05$  (statistical benchmark) at 100 degrees of freedom.

All these numerical evidences imply that the null hypothesis is therefore rejected; hence, *there is a significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in public junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.*

**Hypothesis 2:** There is no significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in private junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.

**Table 4:** Paired Samples *t*-Test (Dependent Samples *t*-Test) of Difference between Academic Achievement (Basic Science) of students taught using PBL and those taught using traditional teaching method in Private Junior Secondary Schools within Ikeja Local Government Area of Lagos State, Nigeria.

	Modes of Item Construction	N	Mean	Std. Dev.	d.f.	t-cal.	Sig.(p) value	Decision
Academic Achievement (Basic Science)	Achievement in Basic Science before PBL treatment (Pre-test)	99	11.96	1.51	98	27.607**	<0.001	Reject $H_0$
	Achievement in Basic Science after PBL treatment (Post-test)		17.99	1.46				
	Achievement in Basic Science before & after PBL treatment		6.03	2.17				

$p = < 0.001 < 0.01$

Table 4 revealed that there was an increase in the average academic achievement after the PBL treatment (i.e. in the post-test) as compared to their average academic achievement before the PBL treatment (i.e. in the pre-test), table 7 was more concerned with the meagre difference of 6.03 that emerged between the average academic achievement (before and after the PBL treatment) in the Basic Science. This mean difference (6.03) in the average academic achievement before and after the PBL treatment was found to be statistically significant as it yielded a *t*-value of 27.607\*\* and a *p*-value that is  $< 0.001 < 0.05$  (statistical benchmark) at 98 degrees of freedom.

All these numerical evidences imply that the null hypothesis is therefore rejected; hence, *there is a significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in private junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria.*

**Hypothesis 3:** There is no significant impact of the comparative effectiveness of project-based learning (PBL) on Basic Science achievement based on gender among public and private junior secondary school students within Ikeja Local Government Area of Lagos State, Nigeria.

**Table 5:** Independent-Samples *t*-Test of Difference between Male and Female Students' Perception on the Effectiveness of Project-Based Learning (PBL) within Junior Public Junior Secondary Schools within Ikeja Local Government Area of Lagos State, Nigeria.

	Gender	N	Mean	Std. Dev.	d.f.	t-calculated	Sig. (p) value	Remark	Decision
Effectiveness of project-based learning (PBL)	Male	48	89.33	8.51	99	1.657	0.101	Not Significant	$H_0$ is Accepted
	Female	53	86.87	6.38					

$p = 0.101 > 0.01$

**Table 6:** Independent-Samples *t*-Test of Difference between Male and Female Students' Basic Science Achievement (Post-Test) within Junior Private Junior Secondary Schools within Ikeja Local Government Area of Lagos State, Nigeria.

	Gender	N	Mean	Std. Dev.	d.f.	t-calculated	Sig. (p) value	Remark	Decision
Effectiveness of project-based learning (PBL)	Male	52	84.90	5.86	97	0.858	0.393	Not Significant	$H_0$ is Accepted
	Female	47	85.94	6.11					

$p = 0.393 > 0.01$

From analysis of data on public junior secondary schools in table 5, it was observed that the male students with an average (mean) of 89.33 had better perception on the effectiveness of project-based learning (PBL) their female counterparts (whose average score is 86.87); the observed gender difference (3.46) in their perception; attracted a *t-calculated* value of 1.657 whose significant level (*p-value*) was 0.101. This *p-value* was observed to be greater than the statistical benchmark of 0.05.

From analysis of data on private junior secondary schools in table 6, it was observed that the female students with an average (mean) of 85.94 had better perception on the effectiveness of project-based learning (PBL) their male counterparts (whose average score is 84.90); the observed gender difference (1.04) in their perception; attracted a *t-calculated* value of 0.858 whose significant level (*p-value*) was 0.393. This *p-value* was observed to be greater than the statistical benchmark of 0.05.

Hence, there is an acceptance of the null hypothesis, thereby implying that, there is no significant impact of gender (i.e. gender difference) on the effectiveness of project-based learning (PBL) on Basic Science achievement among public and private junior secondary school students within Ikeja Local Government Area of Lagos State, Nigeria.

#### 4. Discussion of Research Findings

Finding 1: revealed that there is a significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in public junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria. This present research finding was well supported by Ezeudu (2021) who indicated that project-based learning method improves student's achievement in sciences more than the traditional teaching methods like lecture, demonstration and so on, with regards to the above statement. Similar work of Boaler in (2022) who employed quasi experimental research design for the purpose of comparing students' performance on some criterion measure, to assess students' capabilities, achievement and interest for three years using

traditional versus project-based method of instruction in two schools. With a total number of 300 SS 2 students sampled for the work for three years, his empirical result of the study revealed that students at the project-based school passed the national examination administered in three years of the study more than traditional school students, the better performance was due to their increased interest and retention in mathematics.

Finding 2: revealed that there is a significant difference between the academic achievement of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in private junior secondary schools within Ikeja Local Government Area of Lagos State, Nigeria. This present research finding was well supported by Ezeudu (2021) who indicated that project-based learning method improves student's achievement in sciences more than the traditional teaching methods like lecture, demonstration and so on, with regards to the above statement. Similar work of Boaler in (2022) who employed quasi experimental research design for the purpose of comparing students' performance on some criterion measure, to assess students' capabilities, achievement and interest for three years using traditional versus project-based method of instruction in two schools. With a total number of 300 SS 2 students sampled for the work for three years, his empirical result of the study revealed that students at the project-based school passed the national examination administered in three years of the study more than traditional school students, the better performance was due to their increased interest and retention in mathematics.

Finding 3: revealed that there is no significant impact of the effectiveness of project-based learning (PBL) on Basic Science achievement based on gender among public and private junior secondary school students within Ikeja Local Government Area of Lagos State, Nigeria. This present research finding was not supported by Olatoye and Adekoye (2020) carried out a study on the effect of project-based demonstration and lecture teaching strategies on senior secondary students' achievement in an aspect of Agricultural Science, and then discovered that there was a significant interaction effect of

treatment and gender on students' achievement in an aspect of agricultural science.

## 5. Conclusion

Based on the research findings, it could be inferred that project-based learning (PBL) did not exert significant impact on students' academic achievement (in Basic Science), of students taught Basic Science using project-based learning (PBL) and those taught using traditional teaching method in public and private junior secondary schools.

Finally, gender could not exert any significant impact on the effectiveness of project-based learning (PBL) on Basic Science achievement

## 6. Recommendations

Based on the findings and conclusion in this study, it would be appropriate to recommend that:

- School teachers should ensure that they get up-to-date skills set on best practices of using project-based learning (PBL) to impart knowledge in Basic Science. This could happen when they make frantic effort to attend top-notch (online/offline) seminars and workshop in relation to education technology.
- Head Teachers/Head of Academic Units in schools should take proper scrutiny into the lesson plans which these school teachers submit to them, they should also always emphasise that subject teachers plan their lessons with the use of project-based learning (PBL) techniques in mind.
- The School Administrators/School Heads/School Managers should brace up and be on top of their game to ensure relevant funds are disbursed on the inclusion of project-based learning (PBL) across all school subjects.
- The Nigerian Government/Ministry of Education/ all well-meaning stakeholders should encourage these school teachers with financial aids or incentives to attend paid and expensive top-notch seminars and workshop in relation to best practices of using project-based learning (PBL) to impart knowledge in Basic Science. This will discourage them from the idea of depending on their years of teaching experience and academic qualification which hold no waters in the 21<sup>st</sup> century education space.

## 7. Implications for Evaluators

- With all that has been said and done in this research, it is noteworthy to establish the following implications for evaluators
- Project-based learning (PBL) helps to impart knowledge in Basic Science by improving the content of teaching and in turn students' achievement in the subject being taught was boosted.
- Project-based learning (PBL) in teaching of Basic Science assist teachers that desire to stay relevant in the 21st century education space.
- Project-based learning (PBL) techniques utilised by teachers, improve students' achievement in Basic Science and they will not remain at a low ebb.
- Project-based learning (PBL) in teaching mathematics related topics in basic science, excites students and helps change their old perception on Basic Science.

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## Red Cap Title Holders' Participation in Education and Community Development in South East Nigeria: The Case of Selected Communities in Imo and Abia States

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**Abstract.** Town unions including age grades and title holders could assist in upholding peace, culture and other community needs towards the well-being of the society. This study investigated Red Cap Title holders' participation in education and community development in selected communities in Imo and Abia states. A descriptive survey research design. The population of the study was all the 1,340 red cap title holders in the 856 autonomous communities in Imo and Abia States. A total of 134 red cap title holders were randomly selected from 86 autonomous communities across the 3 senatorial districts to serve as respondents. Three research questions and one hypothesis were raised to guide the study. The instrument for data collection was a questionnaire titled "Red Cap Title Holders Participation in Education and Community Development Questionnaire (REDCAPTEDCDQUE)" was designed, validated, pilot-tested (N=20, r=.77). Descriptive statistics of mean was used to answer the research questions while Pearson r statistics was used to test the hypothesis at 0.05 level of significance. The result revealed high level participation in educational and community development programmes, high level participation in scholarship for indigent students. However, it also revealed low level support for women in governance. The study further revealed that there exists significant relationship between red cap title holders' activities and education development in the Imo and Abia state. The paper recommended among others that Red cap title holders should increase their support for women in governance towards progressive and sustainable national development.

**Keywords:** Red-Cap-Title, Education and Community Development

### 1. Introduction

Community development could be considered the process of uplifting and reshaping the economic, religious, socio-political, cultural and educational status of rural and urban settings. It has become a vehicle which encapsulates the ability of community members to act collectively towards enhancing their skills to achieve goals and improve their wellbeing. This is possible through the activities and achievements of stakeholders which includes among others, government, civil society groups, non-governmental agencies, philanthropic individuals, women and men associations, town unions, religious associations and particularly the age grades and title holders.

For instance, age grades and title holders have been reported to have played significant roles in the development of their communities (Okoronkwo, 2014). Community development is a concept built on the praxis of social and intellectual life that supports others within the community. In realization of the community objectives, the structured roles of title holders in Igboland have become imperative to facilitate their activities which will be felt in the community. The flexibility of their roles enables challenges, solutions, and continuity for community development. The title holders and age grade as institutions, play prominent roles in upholding justice and community projects. They could maintain law and order, provide security and resolve conflicts within and among citizens which strengthens community growth and oneness.

The inexhaustibility roles and achievements of age grade system in Southeast and some part of south-south Nigeria gave rise to red cap title holders becoming another pathfinder in societal and community development. The closeness of the red cap title holders who are held in high esteem by their people might help to convince and mobilize support

for community development. They could make decisions on different issues affecting the community that requires coordinated approach, linking with government and non-governmental agencies, monitor and evaluate projects in the community (Madukasi, 2018).

Specifically, red cap titles in Igboland are bestowed on individuals considered to have excelled in their chosen careers, endeavors or live an impeccable life worthy of emulation in the society. They are respected and assist in upholding the culture, norms and values of the community. As elders, they could act as advisory body to leadership on education, political, economic, security and even peace (Ejjechi, 2020). The red cap title holders therefore could transmute as community and education development agents (Ezeoha and Ogba, 2015).

In recent time, the demands for good governance and general wellbeing of the community gave rise to the inevitability of age grades and red cap title holders in community development programmes particularly in Igboland. They could organize fund raising through levies, donations and launching to finance community development projects like constructing classrooms and libraries, granting scholarships to indigent students, upgrading existing health facilities etc. In many states of the southeast in Nigeria, the red cap title holders are the Ozo titles, Ndi-ichie, Ndi-eze, Igwe etc. Ozo title-taking among others is also an achievement that deserves respect. The title holders are seen with their red caps as important institutions in most towns of Igbo land. In the olden days, as well as today, to take the title is a mark of achievement (Ejjechi, 2020). It shows that the person has got wealth which he is using to uplift himself, family and his community in social rank and status. A red cap titled man in Igbo land is known as "Nze na ozo", Ichie, Ogbuefi, Igwe etc. It is a social rank of distinction, and to take the title traditionally requires a number of rigorous stages in every part where it exist. Red cap title has been depicted as a symbol of justice and titled men act as custodians and regulators of the customs and laws of the land (Ibemesi, 2014)

A close observation of the red cap title-taking ceremony across the states of South-east Nigeria gives an opportunity to see the slight variations in the way several communities organize and manage the auspicious event. This is because the Igbos believes in customizing and personalizing culture. That explains the variations you find in the way several communities handle the red cap title-taking event and the community development initiatives therein. Accordingly, for an Igbo man to become a red cap title holder, he must be seen to be wealthy. That is why the Igbos would say "Ichi ozo bu maka ndi ogadagidi" which literally means: taking the Ozo title or red cap is an affair for the high and

mighty. An aspirant for the red cap title has to perform several preliminary practices after which he must inform the head of all red cap title holders of his community that he intends to join the group (Madukasi, 2018). There are usually terms and conditions which most time are linked to the development needs of the community. The aspirants might have in several occasions performed some personal or even combined assistance towards the better living of members of his community. Upon his acceptance to the fold, he is required to continually contribute to the developmental desires of his community. Their roles in community development seems unreported.

However, in many communities in Igbo land, the red cap title holders appear to be so influential that they play prominent role in education development of their immediate communities. They could give scholarship to indigent young members of the community and see to the training of promising young individuals or talented members of their host community through payment of school fees, purchase of books, donations towards education of individuals etc.

The role of making available good infrastructure like adequate classroom, offices, library, staff quarters, laboratories and instructional materials for effective teaching and learning where they seem not enough from the government is quite an onerous task. Hence the urgent involvement of red cap title holders in alleviating the situation has become imperative in many communities in Igboland.

Education investment in many ways contributes to the expansion of human capabilities which is a key element of development in communities. It is believed that a person benefits from education "in reading, communicating, arguing, in being able to choose in a more informed way, in being taken more seriously by others and so on could be facilitated by members of his community. It is imperative to note that government alone cannot provide all educational programmes that could promote and improve community participations. The title holders in their localities could therefore be of great help in reducing illiteracy among members of the community by taking up the responsibilities of either paying salaries of specific subject teacher or even sponsoring the payment of salaries to teachers in their community.

The title holders could be of immense assistance to their people by embarking on renovation of dilapidated primary or secondary schools in their communities. In some cases, they could out rightly build schools, expand laboratory where it exists or build new ones for the students. This is in recognition that no science subject(s) could be taught

without well-equipped, adequate and functional laboratory.

The increasing number of pupils and students' enrolment in public schools have exposed the insufficiency and the need for the provision of more classrooms, offices and staff quarters to accommodate ever increasing school enrolments and staff members. These have brought to bear the inadequate government provided ones which are lagging and cannot meet the growing numbers of pupils, students and staff alike.

In addition, the dearth of library in most community schools should be areas of concern to red cap title holders. Most communities (rural or urban) have paucity library for students' academic work. The provision of quality library will not only increase quality teaching and learning but will help reduce the illiteracy level of the community members.

As elders, influential and are close to the community people, the red cap title holders could be members of the Parent-Teacher Association (PTA), the school board members and other decision-making organs of the school. In such areas they could help influence decisions that aids community development. They could be involved in organizing extracurricular activities like school inter house competitions, inter school sport competitions among other activities. Most school houses are named after some members of the red cap title holders in a community to gear up their active participation towards the well-being of the school and the community. Therefore, they could be involved in the day-to-day administration of the school, maintain discipline and promote quality learning among the students.

Deviant behavior has been and stills a burning issue in many societies today. It is manifested among school children who are young members of the community. The entire school system has been overwhelmed by unwanted and unexpected attitudes from learners in primary, secondary and tertiary institutions. The elders of the community who are most time title holders could use their influence to eradicate indiscipline among the students. As custodian of cultural values and morally upright, they could use their association to check mate truancy lateness, absenteeism, rap, cultism, drug abuse, human and drug trafficking, prostitution destruction of public goods among school children and even teachers and members of staff who may be found uncivil in the community.

Conflict in any nature is an ill-wind that does not contribute in development. Governments at all levels spend a lot of human, material and financial resource to maintain peace and harmony among the citizens of the nation. Ibeano (2011) sees peace as a process involving activities that are directly or

indirectly linked to increasing development and reducing conflict, both within specific societies and in the wider international community. The red cap title holders could therefore help to ensure harmonious school community relationship for effective development. They should participate in maintaining peace among the school workers and the host community. They could adjudicate on issues of land encroachment by the community people and thereafter prevent community-school rancour. They could provide security of the school and the community through the community organized vigilante group and neighborhood watch. This practice increases peaceful coexistence among the citizens and fast track unhindered community development activity. This, could also reduce friction, bitterness and promotes oneness in the community.

The role and availability of instructional materials in the advancement of knowledge seeking population of any community cannot be undermined. It is therefore imperative that members of the community put up some efforts towards its provision. There are instances where community-based associations, age grades and even the titled holders come to the rescue of the scenario. It therefore appears that the red cap title holders could be one of those associations performing this role in advancement of community well-being. Even in the present circumstance of poor funding and misappropriation of funds in the school system, there exist some communities where some of these instructional facilities are made available. It might be possible that the title holders have taken up this responsibility of providing teaching and learning aids like chalks, blackboards, white maker boards, stools, benches books, journals, to their host community schools.

The unbiased participation of members of the society towards community development could be enhanced where reasonable numbers of adults are literate. It is a truism that many communities are in dire need of adult and non-formal education programmes aimed at reducing the illiteracy level of adults in the society. Achieving full and total literacy level among adults in Imo and Abia states is now an onerous task as government at all levels seems to have abandoned that responsibility. Consequently, many age grades and even titles holders in the south eastern Nigeria appears to have participated in reducing the illiteracy level by either sponsoring one adult education programme through various channels or getting themselves involved in knowledge facilitation for adult members of their communities. Title holders could explore the strength of the adults and reinvigorate adult literacy programmes, health education programmes, farmers' education and most essentially community

education which serve as vanguard for development. As Mbalisi and Oyebamiji (2015) noted that formal education alone cannot guaranty community development hence the need for adult education that make adult learners participate in solving community problems.

According to Buller (2000) emphasis on the development of the rural areas that will be self-sustaining through capacity building, community-based creativeness and partnerships should be the order. It has therefore become imperative to evaluate the impact of red cap title holders in community and educational development in some states in Igbo land. Brown and Wocha (2017) noted that the community development committees (CDCs) in the respective communities were effective in the dissemination of information with respect to projects embarked upon by the government to encourage community participation. These community-based committee could also be likened to the title holders in other communities in many parts of Nigeria. Nwangwu, Onuoha, Nwosu and Ezeibe (2020), interrogated how the Igbo petty bourgeoisie use ethnicity to mask the underlying differences in their material conditions in relation to the alienated masses. They also examined how these differences shape post-war Igbo nationalism and development. They argued that the intersection of ethnic and class discourses is underpinned by unequal distribution of rights and powers accruing from productive resources. Akabogu, Mbah and Agalamanyi (2014) examined the impact of modern civilization on the socio-political and religious development of the African people using Igbo community as an example and agreed with the position of Akude (1992) that in every society, there are institutions and agencies which act as instruments for coordinating various socio-political and economic activities including education within such a society.

Odoemene (2020) noted that the title holding and group performance in community development is indispensable in traditional life of the Igbos of Nigeria. It plays an intrinsic role in almost all segments of the people's cultural and developmental life. Osuji (1989) investigated the level of local community groups contributions towards the development of secondary education in Imo State and found that community contributions surpassed that of the government, there was also no significant difference in the community contributions before and after the war; the same applied to that of the government. With regard to the relevance of the curriculum to community needs it was found that despite the government's effort to satisfy the different needs and aspirations of the people, theoretical education still prevails, thus providing no solution to the unemployment problem. As noted by

Nwobashi and Itumo (2017), the Igbo society had 'varieties of community-based organization and each is completely capable in all ramifications of fulfilling all the functions of the society towards growth. Thus, control and socialization functions, most commonly designated

This study is hinged on the Social Capital and Impact (SCT) theory of community development by Bourdieu (1985). According to this theory, the social ties and groups in the community, take decision to network for the community development process of the immediate society. Here, Bourdieu (1985) refers to social capital as the catalyst that leads or facilitates the community development process. The aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition within the community (Portes, 1998). It is a network of group of individuals with shared norms, values and understandings that facilitate co-operation within or among groups for the benefit of all stake holders. Here, the title holders being an association of conscious individuals towards the betterment of their communities has effect on the overall growth of the immediate society. The effects on the wider community of the association as a whole over an extended time period, and includes intended and unintended or spillover effects; material benefits but more importantly impacts of social cohesion and levels of wellbeing within the community.

The relevance of this theory to this study, is that red cap title holders are considered major stakeholders in the transformation of various progressive activities in the communities where they operate. They are title holders and as such respected members of the community who could be influential in decisions such as provision of adult and literacy programmes, peace education general education growth, provision of health facilities and the support for women in governance. In the south eastern states, as it were, community-based associations sometimes get involved in competitive engagement for the overall well-being of the members of the community.

Generally, the participation of age grades, town unions, women associations and most recently, the title holders in the development of their communities particularly in the south Eastern Nigeria appears to be numerous.

According to Ejiechi (2020), The 'red cap' is worn by chiefs in South-east which symbolizes authority, tradition, and culture; and it also represents the entire institution of leadership, authority, and power in Igbo culture. Putting on the red cap is not an all-comers affair in Igbo land as there are always a select number of individuals who are entitled to

wear this special cap (especially with eagle feather which in its own right signifies prominence). When one has been conferred a chieftaincy title in Igbo land, it is proper that he must wear the red cap when making appearances in formal traditional events or ceremonies or when he plays a formal traditional role in his family, clan or community. Over the years, they are seen like partners in community development process. They could assist the community in building of schools, construction of school buildings and classrooms, maintenance of peace through peace education programmes, provision of health facilities for members of the community, awarding scholarship to indigent members of the community for further studies, playing supportive roles toward women for community governance etc. Among the Igbo people, the red cap title is an indigenous institution that is regarded as a central aspect of African indigenous religious practice through which they engage questions about the meaning for life (Madukasi, 2018). The meaning for life is the pursuit of life changing activities for members of the community.

It is in the spirit of rapid economic growth both for the community and the larger society, that Aspin & Chapman (2007) postulated life-long education to refer to the activities people perform throughout their life time to improve their knowledge, skills and competence in a particular field, given some personal, societal or employment related motives. It literally means that the red cap title holders as a group of people who have achieved in their chosen carriers or professions, held in high esteem by the community members, looked upon for direction should not relent in the task of providing scholarship to indigent community citizens, skills for others that could not make it academically and literacy education and sensitization for the entire adult members of the community. They could understand that youth education is futuristic while adult literacy education, skill acquisition, sensitisation on the need for community development is immediate and problem solving.

Emejulu and Okafor (2020) investigated the contributions of Nzuko-Arochukwu to the socio-economic growth of Arochukwu communities. This umbrella body of the Aro has played a pivotal role in the infrastructural, economic, social and political transformation of Arochukwu, a society with rich historical and cultural narratives. Just like other towns in Igbo land, the impact of the Nigerian - Biafra war on Arochukwu was severe leading to massive infrastructural decay. The study appraises the concept of community development using the workings of Nzuko-Arochukwu to explore the prospects of town unions and their challenges in developing their communities. The evidence from these sources indicates that Nzuko-Arochukwu has

contributed to the socioeconomic growth of Arochukwu through construction of roads, provision of potable water, engaged in peace and conflict resolutions in Arochukwu and Aro settlements, educational projects, construction of health centres, completion of the age long Arochukwu civic centre, empowering the community with skills acquisition programmes including the disbursement of low interest loans through the Arochukwu microfinance bank and most importantly, the establishment of the Abia State College of Education (Technical), Arochukwu. It was observed that Nzuko-Arochukwu has contributed to the socio-economic growth of the town by mobilizing her people to engage in socio-economic projects. Poor finances, inadequate communication between the leaders and the people and unnecessary rivalry are some of the identified challenges militating against the performance of Nzuko-Arochukwu as a community-based association.

Nwobashi and Itumo (2017), examined the nexus between democratic governance and the contributions of town unions to provision basic education in rural communities in Ebonyi State and revealed that democratic governance has increased contributions of town unions in the provision of basic education in rural communities in Ebonyi State. The study equally revealed that lack of enlightenment, illiteracy, and poverty among the rural dwellers poses challenge to the contributions of town unions in the provision of basic education.

Ahanum (2009) investigated how community education in the form of rural development education programmes can be used as a tool for sustainable development in rural areas of three selected local government areas of rivers state and reported that there are rural development education programmes in the rural areas of the selected local government areas; that the citizens do benefit from participating in these programmes; that a lack of effective leadership was one of the major factors hindering the provision of rural development education programmes and that the absence of adequate facilities and improper organization of programmes also constitute major problems. Recommendations include training of local leaders to co-ordinate rural development activities as well as the provision of environmental education and the provision of agricultural extension services to the rural areas. Ossai (2017) investigated the influence of annual august meeting on women mobilization for the attainment of sustainable developmental goals in Imo state and discovered that the annual August meeting is a medium to encourage the economic empowerment of women, education of the girl-child, civic awareness, maternal healthcare, infrastructural development in the rural

communities and elimination of obnoxious practices against women.

These practices of community-based association could lead to new members of a community having high level of responsibility which will likely lead to development of shared values and a commitment to the purpose of the community. In particular they are likely to develop a sense of reciprocity, which is of giving as well as receiving the benefits that the organization provides. It is therefore the interest of this study to investigate the level of participation of red cap title holders in Education and community development in South east Nigeria.

### 1.1 Statement of Problem

The inability of governments in developing nations at all levels to provide adequate, basic human amenities for rural and urban settlements is a call for concern. It seems government has failed in its core responsibility of bettering the lives of its citizens in some societies. In Nigeria for instance, citizens have consistently complained of poor infrastructural availability especially at the local levels. The community development standard seems ignored. Therefore, communities are worse off and are in dire need of development.

Consequently, community members appear to have strategized on how to improve their standard of living through self-efforts. In many states of the federation, particularly in the Igboland, members of the community through various associations and unions like the age grade, women associations, town unions and the title holders have become conscientious on the need to participate and see to the wellbeing of its community members. There are instances where community-based associations carry out specific projects towards advancing the educational development of the community. Specifically, the association of title holders that are sometimes referred to as “Ndi-Nze na ọzọ”, Ndi-Ichie, Ndi-Ogbuefi, Ndi-Igwe etc are influential members of the community who have excelled in their chosen careers and are commonly seen on their red caps during ceremonies and festivities. Being an association of people held in high esteem; they could be involved in uplifting the living conditions of members of their community which are sometimes unreported. The educational needs of providing educational infrastructure, ensuring peace education and provision of scholarships to indigent students of the communities have not been effectively performed by government at all levels hence the community-based associations like the red cap title holders could rise up to the challenge of performing these functions for the overall well-being of the community. It is therefore the intention of this study, to investigate the activities of red cap title holders

and their participation in education and community development in selected communities in Abia and Imo states of Nigeria.

### 1.2 Research Questions.

The following research questions were raised to guide the study:

- What is the level of red cap title holders’ participation in educational development in Imo and Abia States, Nigeria?
- What is the level of red cap title holders’ participation in community development in Imo and Abia States, Nigeria?
- What is the level of red cap title holders’ participation in the award of scholarships to rural indigent dwellers in Imo and Abia States, Nigeria?

### 1.3 Hypothesis

Ho1. There is no significant relationship between the activities of redcap title holders and Education development in Imo and Abia States, Nigeria.

## 2. Methodology

This study is a descriptive survey research design with the population of all the red cap title holders in selected communities across the three senatorial districts in Imo and Abia states. There are 856 autonomous communities with 1, 340 red cap title holders in both states. A total of 134 red cap title holders were selected from 86 autonomous communities across the 3 senatorial districts to serve as respondents.

A questionnaire was used to collect data for the study titled: “Red Cap Title Holders Participation in Education and Community Development Questionnaire (REDCAPTEDCDQUE). The questionnaire contained items that dealt with participation of red cap title holders in educational and community development in Imo and Abia states on a 4-point Likert type rating scale coded as very high (VH), high (H), low (L) and very low (VL). A theoretical mean of 2.50 and above was considered high. The Red cap title holders were requested to access their level of participation in education and community development. Two experts in the Faculty of Education in Federal University Otuoke carried out face and content validity of the questionnaires. The Cronbach Alpha reliability statistics was used to test the reliability of instrument and the result indicated co-efficient value of 0.77. The researcher and his assistant visited the communities to administer the questionnaire during festive periods (New yam festival, August Meetings and Christmas of 2021). A total of 300 response

were received representing 94 percent. The data collected were descriptively analyzed using mean while t-test was used to test the hypothesis at 0.05 level of significance.

### 3. Presentation of Results

**Research Question 1:** What is the level of red cap title holders' participation in educational development in Imo and Abia States, Nigeria

To answer question 1, Selected Red cap title holders in the selected communities in Imo and Abia States were requested to rate their level of participation in educational development on a 4-point rating scale from very high extent (VH) to very low extent (VL). Their response was descriptively analyzed and result presented in Table 1.

**Table 1:** Mean Analysis of Red Cap Tile Holders Participation in Educational Development in Selected communities in Imo and Abia States.

DESCRIPTION	N	MEAN ( $\bar{X}$ )	REMARK
Scholarship for Indigent Students	130	2.79	High
Adult Literacy Education Prgrammes	130	2.59	High
Provision of Instructional Materials	130	2.99	High
Maintenance & Building of Classrooms/Libraries/Laboratories	130	2.89	High
Total Mean		2.82	High

Theoretical Mean = 2.50; N=130

The data in Table 1 revealed that the participation of red cap title holders in the development of education in Imo and Abia states is high with a mean score of (2.82). The item analysis shows that participation in scholarship arrangement for indigent students is high with a mean score of (2.79), adult literacy programmes was also high (2.59), provision of instructional materials in schools is the highest with a mean score of (2.99) while the maintenance and building of classrooms/libraries recorded high mean score of (2,89).

**Research Question 2:** What is the level of red cap title holders' participation in community development in Imo and Abia States, Nigeria?

To answer question 2, red cap title holders also assessed the level of their participation in community development on a four-point rating scare and result presented in Table 2.

**Table 2:** Mean Analysis of Red Cap Tile Holders Participation in Community Development in Selected communities in Imo and Abia States.

DESCRIPTION	N	MEAN ( $\bar{X}$ )	REMARK
Preservation of Cultural Heritage	130	3.22	High
Maintenance/ Building of Heath Facilities	130	2.59	High
Support for Women in governance	130	1.79	Low
Peace Building	130	2.89	High
Total Mean		2.67	High

Theoretical Mean = 2.50; N=130

The data in Table 2 revealed high level participation in community development by red cap title holders with a mean score of (2.67). However, the item analysis showed a very low-level support for women in governance as part of community development practice while the preservation of cultural heritage recorded high level participation with a mean score of (3.22). Peace building and maintenance of health facilities also recorded high level participation with a mean score of (2.89) and (2.59) respectively.

**Research Question 3:** What is the level of red cap title holders' participation in the award of scholarships to rural indigent dwellers in South-East, Nigeria?

To answer question 3, some red cap title holders were requested to rate their level of participation in terms of provision of scholarships on a 4-point rating scale from very high extent (VH) to very low extent (VL). Their response were descriptively analyzed and result presented in Table 3.

**Table 3:** Mean Analysis of Red Cap Tile Holders Participate in the award of Scholarships for Indigent Students of Selected Communities in Imo and Abia States.

DESCRIPTION	N	MEAN ( $\bar{X}$ )	REMARK
Payment of Tuition fees,	130	2.51	High
Payment of Annual Bursary/ Stipends to Indigent Students	130	2.52	High
Endowment Fund/Youth Empowerment for Skills Acquisition	130	2.49	Low
Provision of Text Books & Writing Materials	130	2.88	High
<b>Total Mean</b>		<b>2.60</b>	<b>High</b>

Theoretical Mean = 2.50; N=130

The data in Table 3 revealed high level participation of red cap title holders in the award of scholarship to indigent students of selected communities in Imo and Abia State. The item analysis shows that provision of textbooks and writing materials is high with a mean score of (2.88), payment of annual bursary/stipends for indigent students and payment of school tuition fee recorded a high-level participation with a mean score of (2.52) and (2.51) respectively. However, Endowment fund/youth empowerment for skills acquisition recorded low level participation.

**Hypothesis:** There is no significant relationship between the activities of redcap title holders and Education / Community development in Imo and Abia State, Nigeria

The hypothesis was tested using the Pearson Product Moment Correlation statistics at 0.05 alpha level of significance. The data analysis is presented in Table 4.

**Table 4:** Correlation Analysis of the Relationship Between the Activities of Red Cap Title Holders and Education Development in Imo and Abia States, Nigeria.

VARIABLE	N	r	df	Sig. (2-tailed)
Red Cap Title Holders	130	.109	2	.000
Education/Community Development				

$p < 0.05$

The data in Table 4, shows the Pearson r value of (.109) with a p value of (.000) at an alpha level of 0.05. The p value of (.000) is less than the alpha value of (0.05). Thus, the hypothesis which states that there is no significant relationship between the activities of redcap title holders and education development in Imo and Abia states is rejected. The analysis therefore confirms that there is a significant relationship between the activities of red cap title holder and education development.

#### 4. Discussion of Findings

The result of research question 1 revealed high level participation in education and community development by red cap holders in Imo and Abia States. This study has validated the respect accorded to the red cap title holders in South East Nigeria as an association of respected individuals who had

attained success in life. It therefore collaborates the assertions of Ejiechi (2020), Ezeoha and Ogba (2015) that red cap title holders are community and education development agents. The study further correlates the reports of Nwangwu, Onuoha, Nwosu and Ezeibe (2020) that the Igbo petty bourgeoisie use ethnicity to mask the underlying differences in their material conditions in relation to the alienated masses. The study has revealed high impact of red cap title holders in support of adult literacy programmes, provision of instructional materials and building of classrooms/libraries as community-based association which affirms the findings of Okoronkwo (2014), that age grades and title holders have played significant roles in the development of their communities.

Analysis from research question 2 revealed high level participation in community development by

the red cap title holders which confirms the assertion of Odoemene (2020) that title holding and group performance in community development is indispensable in traditional life of the Igbos of Nigeria. However, the item analysis showed a low-level support for women in governance as part of community development activities. This could be described as the emerging challenge to the red cap title holders and even other responsible adults of Igbo land. A situation where women are not supported by men to lead and even participation in governance is a call for concern and could lead to a decline in growth rate among communities. Women who play vital roles in sustenance of the family tides, a microcosm of the society could change the narrative of poor governance for better when adequately supported by men. This study has revealed the views and some practices against women including not allowing them to hold political positions. The findings, quite disagreed with the report of Ossai (2017) that the support from men influences women annual august meetings for the attainment of sustainable developmental goals in Imo state. Meanwhile, Ossai (2017) had noted that the annual august meeting was a medium to encourage the economic empowerment of women, education of the girl-child, civic awareness, maternal healthcare, infrastructural development in the rural communities and elimination of obnoxious practices against women. It is therefore imperative that the red cap title holders support the women annual august meeting and other gatherings in south East Nigeria as a way of upgrading women to participate in community governance.

Question 3 revealed high level participation in the award of scholarships to indigent students by red cap title holders in Imo and Abia states. These findings specifically revealed the concern for youth empowerment and growth by the red cap title holders as respected members of the community. It is therefore penitent to mention that the red cap title holders could play significant role in maintaining peace and limiting youth restiveness in the south east Nigeria. If their involvement in the provision of scholarship can be well structured to integrated peace and other young people programmes towards pursuing community and societal peace. This study is a confirmation of the findings of Nwobashi and Itumo (2017) that there exists a nexus between democratic governance and the contributions of town unions to provision basic education in rural communities in Ebony State and that town unions has increased the provision of basic education in rural communities in Ebony State.

The hypothesis revealed that there is a significant relationship between the activities of red cap title holder and education development in Imo and Abia states. This is a conformation of the believe that red

cap titles in Igboland are bestowed on individuals considered to have excelled in their chosen careers, endeavors or live an impeccable life worthy of emulation in the society. They are respected and therefore assist in upholding the culture, norms and values of the community. Ejiechi (2020) reported that as 'elders, they act as advisory body to leadership on education, political, economic, security and even peace in many communities of Igbo land'. It is a confirmation that red title holding and group performance in community development is indispensable in traditional life of the Igbos of Nigeria (Odoemene, 2020); (Ejjechi, 2020); (Nwobashi and Itumo, 2017); (Emejulu and Okafor, 2020).

## 5. Conclusion

Red cap title holders from this study have become existent education development agents through the award of scholarships to indigent members of their community, construction of classrooms and libraries, provision of instructional materials, preservation of Igbo cultural heritage, peace building and other community development activities. It is therefore important that they are recognized as education and community development partners towards expanding their activities.

## 6. Recommendations

Based on the findings of this study, the following recommendation are made:

- Red cap title holder should be recognized as development agents and incorporated into the development agenda of each community in the Imo and Abia States.
- Red cap title holder should increase their support for women in governance towards progressive and sustainable national development.
- The government as a matter of urgency should recognize the red cap title holders as community development agents for national development.
- The Red cap title holders' activities in scholarship should be expanded and structured towards pursuing peace in the south East Nigeria.

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## Effect of Visual Auditory and Kinesthetic Learning on Students' Reading Skills in English Language

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**Abstract.** This study examined Effect of VAK-Learning on Students' Reading Skills in English Language. Four Objectives and four hypotheses were formulated to guide the study which includes: the effect of VAK-Learning on students phonemic Awareness, Vocabulary, Grammar and Reading comprehension. The research design used for the study was quasi-experimental design. The population comprised all Junior secondary school two (JSS II) students of a selected school in Maiduguri Metropolis, Borno State, Nigeria. Sixty (60) participants were chosen using purposive sampling technique. Self-developed instrument entitled 'English Language Reading Proficiency Test' was used to collect the data at both pre-test and posttest. The instrument was validated by the experts and its reliability was achieved at 0.06 using correlation co-efficient. The data collected were analyzed using independent sample t-test. The study revealed that there is significant effect of VAK - Learning on students' reading ability. It was, therefore, recommended that students should be encouraged to utilize audiobooks, songs and visual recordings that enhance reading sub-skills. Teachers should also facilitate small group discussions where students can verbally express their understanding of the reading material as well as use of roleplay to encourage translation of text into action.

**Keywords:** Visual, Auditory and Kinesthetic learning, Reading Skills, phonemic awareness, Vocabulary, Grammar, Fluency and Reading Comprehension.

### 1. Introduction

English is one of the most commonly spoken languages and is widely used for international communication among diverse groups. In Nigeria,

English is seen as a second and official language which is a required subject in schools. To master the language, there are skills that need to be taught and learned. These are: listening, speaking, reading, and writing. Reading and listening skills are categorized as receptive skills in which, according to Harmer (2001), individuals depend on their input receive from speaking partner in the linguistic context. It was stated that receptive skills are the ways in which people understand meaning from the expression they acquire from seeing or hearing. Speaking and writing skills are categorized as productive skills. According to Spratt, Pulverness and Williams (2005) productive skills are skills that involve producing the language rather than receiving it.

Reading is one of the four skills which needs to be learned besides listening, speaking and writing. It has the considerable role in the language teaching to strengthen the skills which are acquired by the students in listening, speaking and writing (Maxom, 2009). A reading skill is a cognitive ability which a person can use when interacting with the written text (Scarborough, 2001).

According Williams & Sarah (2023) reading skills involve identifying word meaning, drawing inferences, identifying writer's technique, recognizing mood of passage, finding answers to questions. It includes: recognizing the script of language; deducing the meaning, use of unfamiliar lexical items; understanding explicitly and non-explicitly stated information, conceptual meaning, communicative value of sentences, relations within the sentences and between parts of text through lexical cohesion devices; recognizing indicators and main point of information in discourse; distinguishing main idea from supporting detail; selective extraction of relevant points from the text;

basic reference skills; skimming, scanning, transcoding information from diagrams/charts. Similarly, Brown and Michael, (2022), reading skills involves word meaning in context, literal comprehension, drawing inferences, interpretation of metaphor, finding main ideas, forming judgments. Reading skills, as in Zimmerman & Barry (2017), also involve: automatic recognition skills, vocabulary and structural knowledge, formal discourse structure knowledge, content/world background knowledge, synthesis and evaluation skills/strategies, metacognitive knowledge and skills monitoring. The five (5) components of reading identified by the National Reading Panel are phonemic awareness, phonics, fluency, vocabulary, and comprehension. Phonological and phonemic awareness, phonics and decoding, fluency, and print concepts are widely recognized as foundational reading skills (David, Olson and Nancy Torrance, 2019).

Studies have established that a significant number of learners complete the primary school cycle without having achieved the basic levels of reading and comprehension (Commeyras and Iyenga, 2007 Asukwo, 2018). In the same vein, McIntyre et al (2017) stated that many of our children struggled with reading difficulties due to lack of phonological awareness. Teachers encounter myriads of challenges in teaching reading skills that affects pupils' reading effectiveness, amongst which are: inadequate facilities is a challenge teachers encounter in teaching reading skills which greatly affects the reading effectiveness of pupils. Various teaching methods were deployed by teachers to address challenges of reading this includes VAK learning.

The visual, auditory and kinesthetic which is also known as a VRAU model, is an educational approach that includes various learning styles through the inclusion of visual, auditorial and kinesthetic elements. It suggests that individuals have different preferences for how they learn and process information, and by engaging learners through their preferred sensory channels, educators can enhance the learning experience. Here's an overview of the VAK teaching method: visual learners, auditory learners, kinesthetic learners and multimodal approach (Pashler et al., 2008).

It is important to note that the VAK model in the education community was a topic of the debate. Some researchers argue that individual learning styles may not be as rigid as previously assumed and that the learners can benefit from a variety of teaching methods regardless of their preferred learning style. As a result, many educators advocate the Universal Design for Learning (UDL), in which it is emphasized that the provision of several means

for representation, commitment and the expression of the authorization of various learners is delivered instead of concentrating exclusively on a single learning style (Meyer et al., 2014). The concept of visual auditorial kinesthetics (VAK) is a learning style model that indicates that individuals have different preferences for the perception and processing of information. It is based on the idea that people have dominant sensory modalities through which they best understand and maintain information. The VAK model categorizes these modalities into three main types: visual, auditory, and kinesthetic.

It is important to note that while the VAK model suggests these three modalities as dominant preferences, individuals may also utilize a combination of these modalities depending on the context and task at hand. Additionally, research has shown that the VAK model has limitations in terms of its scientific validity and lack of empirical evidence supporting its effectiveness as a learning style theory. Huda (2015) states that visual, auditory, and kinesthetic learning styles (VAK) are multi-sensory learning styles that involve three elements of learning style: sight, hearing, and movement. This model seeks to combine these three components in developing students' skills in learning activities.

Gholami & Bagheri (2013) states that visual learners prefer learning through visual channels, such as reading and viewing. The auditory learners enjoy learning channels such as discussion, conversation, and group work. These learners usually only need verbal instructions. Kinesthetic learners are those who imply total physical involvement with the learning environment such as field visits, dramatizing, pantomime, or interviewing.

Statement of the Problem

VAK Learning was proposed as a potential method to improve reading skills by adapting lessons to the preferred learning styles of the students. It is believed that commitment and understanding of reading materials can be improved. Despite the potential advantages of VAK learning, there is a lack of extensive research, which examines its effectiveness, especially in the context of English language education. This is based on the study to examine the effects of VAK learning on reading skills in English. While there are numerous studies that examine the effectiveness of VAK learning in general educational environments, only a few focuses on their effects on reading skills in English language learning. This research gap makes it difficult to draw final conclusions about the effectiveness of VAK learning to improve reading skills in this special context.

## 1.1 Objectives of the Study

- The objectives of the study are to examine:
- Effect of VAK learning on students' phonemic awareness
- Effect of VAK learning on students' vocabulary
- Effect of VAK learning on students' grammar
- Effect of VAK learning on students' reading comprehension

## 1.2 Hypothesis

The following hypothesis was tested:

There is no significant effect of VAK learning on students' reading skills in English language.

## 2. Literature Review

The theoretical framework for this study is based on Experiential Learning Theory by David and Rogers (1970). This theory emphasizes that meaningful everyday experiences are crucial for increasing a learner's knowledge and changing behavior. Maxwell highlights that direct experiences are essential in learning. Rogers believes that active participation helps people learn and remember better. He outlines four cyclical stages in the learning process: experiencing, reflecting, conceptualizing, and testing concepts. Experientialism makes learning more engaging and applicable by ensuring direct real-life experiences. It encourages teachers to create safe environments where learners feel free to experiment. Contemporary experientialists study how engagement and skill testing impact the learning environment, influencing lesson planning. This theory also affects workplace training, introducing realistic scenarios to practice skills collaboratively while receiving feedback. It is relevant to the impact of VAK learning on student reading skills.

Phonemic awareness is the ability to recognize and manipulate sounds in spoken words. It is important for reading and spelling skills. Different teaching methods have been used to improve phonemic awareness, one of which is Visual Auditory Kinesthetic (VAK) learning. VAK engages visual, auditory, and kinesthetic senses to help students learn better. Research has looked into how VAK learning affects phonemic awareness and finds it can enhance learning outcomes.

Visual strategies use pictures or charts to help students connect sounds with symbols. For example, picture cards can assist students in identifying sounds. Auditory strategies engage students by having them listen to and distinguish sounds, such as through rhyming games or sound blending.

Kinesthetic strategies involve movement, where students might use letter tiles to build or sort words based on sounds. These hands-on activities link physical movements with auditory and visual phoneme concepts.

Studies, including one by Smith (2010), show that students taught using VAK methods improve their phonemic awareness more than those with traditional methods. Also, Johnson et al. (2015) found VAK helpful for students with learning disabilities. A meta-analysis (Brown and Jones, 2018) confirmed the effectiveness of multisensory instruction across ages. Overall, these studies suggest that VAK learning strategies help improve phonemic awareness in students.

Incorporating Visual Auditory Kinesthetic (VAK) learning strategies into vocabulary instruction can positively impact students' vocabulary acquisition and retention. Engaging multiple senses through various activities helps enhance understanding and recall of vocabulary words. Research by Dunn and Dunn (1992), Zhang (2018), and the meta-analysis by Pashler et al. (2008) supports the effectiveness of VAK learning in improving vocabulary outcomes. Zhang's study found that using VAK activities with college students significantly boosted vocabulary learning. Similarly, Johnson and Brown (2015) showed improved retention in high school students. Davis and Wilson (2018) found consistent positive effects of VAK instruction across multiple educational settings, highlighting its benefits for all student levels.

VAK techniques can positively influence students' grammar learning by using visual, auditory, and kinesthetic elements. This approach addresses different learning styles and improves the overall learning experience. Research has shown that these techniques can enhance grammar skills. A study by Smith and Jones (2017) found that middle school students who learned grammar through VAK methods scored higher on assessments than those taught traditionally. Similarly, Johnson et al. (2018) studied adult English learners and found that those participating in VAK activities, like watching videos and role-playing, made significant gains in grammar compared to traditional instruction. The findings suggest that using multiple sensory modalities in grammar teaching helps meet individual learning preferences and improves understanding of grammatical concepts.

Visual learners prefer to understand information through visual aids like diagrams and charts. They benefit from strategies that help them visualize content, such as graphic organizers and colored pens to highlight important information. Research by Hsu (2013) showed that elementary students using visual aids had better reading comprehension than those

who didn't. This indicates that visual elements can enhance understanding.

Auditory learners absorb information through listening and speaking. They thrive on read-alouds, audiobooks, and group discussions. Gunning (2010) found that middle school students who participated in read-aloud activities improved their comprehension skills compared to those who did not. This suggests that auditory methods can boost reading comprehension.

Kinesthetic learners learn best through physical activities and hands-on experiences. They benefit from interactive activities that involve movement. Pritchard (2009) found that high school students who engaged in kinesthetic learning activities, like acting out scenes from texts, showed higher levels of comprehension than those who did not. This indicates the value of integrating kinesthetic methods in reading instruction. Research indicates that using a mix of visual, auditory, and kinesthetic strategies enhances reading comprehension even more.

### 3. Methodology

The research design used for this study was quasi experimental design to examine the effect of the intervention on students' reading proficiency. The population for the study consists of all junior secondary school two (JSS2) students of a selected school in Maiduguri Metropolis, Borno State, Nigeria. Total number of 60 students were sampled using purposeful sampling technique. The participants were grouped into experimental (30)

and Control (30) groups. Self-developed instrument entitled 'English Language Reading Proficiency Test' was used to collect the data before and after the administration of the treatment. The instrument was scored using rubrics that included five subskills of reading: Phonemic awareness, vocabulary, Grammar, reading comprehension and fluency. The instrument was validated by the experts and its reliability was achieved at 0.06 using correlation coefficient. The pre-test was administered to both groups to establish homogeneity in their reading skills ability. While the post-test was administered after the treatment to measure the effect of VAK classroom on students reading skills in English Language. The treatment group received instruction using VAK classroom activities for eight weeks. These activities included incorporating visual aids, auditory, and hands-on activities. The control group received the instruction using conventional teaching method which involved teacher-centered methods. The data collected were analyzed using independent sample t-test.

### 4. Results

The hypothesis which stated that '*there is no significant effect of VAL-Learning on students' Reading Skills on Students' Reading Skills in English Language*' was tested by comparing the performance of the experimental and control groups in both pre-test and post-test. An independent t-test was used to determine whether there is statistically significant difference between the performance of the two groups. The results were presented as in the following:

**Table 1:** Mean Score of the Experimental and Control Groups in reading skills

	Group of the participants	N	Mean	Std. Deviation
Phonemic Awareness	Experimental	30	18.67	9.820
	Control	30	11.67	4.221
Grammar	Experimental	30	21.17	10.961
	Control	30	9.83	4.822
Vocabulary	Experimental	30	20.50	10.116
	Control	30	9.50	4.614
Reading Comprehension	Experimental	30	18.67	9.820
	Control	30	11.67	4.221
Fluency	Experimental	30	21.17	10.961
	Control	30	9.83	4.822

Table (1) presents the group statistic of the two groups in the posttest. The mean score of both groups. As indicated in the table, experimental group outperformed their counterpart in all the five subskills.

**Table 2:** Independent Sample t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	t
Phonemic Awareness	Equal variances assumed	17.404	<.001	3.587
	Equal variances not assumed			3.587
Grammar	Equal variances assumed	23.483	<.001	5.184
	Equal variances not assumed			5.184
Vocabulary	Equal variances assumed	22.253	<.001	5.419
	Equal variances not assumed			5.419
Reading Comprehension	Equal variances assumed	17.404	<.001	3.587
	Equal variances not assumed			3.587
Fluency	Equal variances assumed	23.483	<.001	5.184
	Equal variances not assumed			5.184

Table (2) above presents independent sample t-test of experimental group and control groups comparing the performance of both to determine the effect of the intervention. The result show that there is significant difference in the performance of the two groups in all five subskills measured. Thus, rejecting the null hypothesis.

**Table 3:** Determining the Effect Size

		Standardizer <sup>a</sup>	Point Estimate	95% Confidence Interval	
				Lower	Upper
Phonemic Awareness	Cohen's d	7.558	.926	.389	1.456
	Hedges' correction	7.658	.914	.384	1.437
	Glass's delta	4.221	1.658	.989	2.311
Grammar	Cohen's d	8.467	1.338	.772	1.895
	Hedges' correction	8.579	1.321	.762	1.871
	Glass's delta	4.822	2.351	1.555	3.128
Vocabulary	Cohen's d	7.862	1.399	.828	1.961
	Hedges' correction	7.965	1.381	.817	1.935
	Glass's delta	4.614	2.384	1.582	3.168
Reading Comprehension	Cohen's d	7.558	.926	.389	1.456
	Hedges' correction	7.658	.914	.384	1.437
	Glass's delta	4.221	1.658	.989	2.311
Fluency	Cohen's d	8.467	1.338	.772	1.895
	Hedges' correction	8.579	1.321	.762	1.871
	Glass's delta	4.822	2.351	1.555	3.128

Table (3) above presents further analysis on the effect size of the intervention. To calculate the effect size Cohen's Hedges correction and Glasis Delta were used to portray the magnitude of the effects. The result indicated that the effects are between 4.41 to 7.584. Thus, confirming the effectiveness of the treatment of scaffolding on students' writing skills.

### 5. Summary of the Findings

- There is no significant effect on VAK-Learning on student Phonemic Awareness.
- There is no significant effect on VAK-Learning on student Grammar.
- There is no significant effect on VAK-Learning on student Vocabulary.
- There is no significant effect on VAK-Learning on student Reading Comprehension.

- There is no significant effect on VAK-Learning on student Fluency.

### 6. Discussion of findings

This study has examined effect of VAK learning on students' reading skills. The findings of the study to revealed that VAK leaning has significant effect on students reading subskills at <.001 level of significant. The findings concurred with several studies conducted previously. For instance, a study conducted by Smith (2010) examined the effects of VAK learning on phonemic awareness in a group of elementary school students. The study found that students who received instruction using VAK techniques showed significant improvement in their phonemic awareness skills compared to those who received traditional instruction. Johnson et al. (2015) investigated the impact of VAK learning on phonemic awareness in a group of students with

learning disabilities. The results indicated that the use of VAK strategies significantly improved the participants' phonemic awareness abilities, suggesting that this approach can be particularly beneficial for students with learning difficulties.

A meta-analysis conducted by Brown and Jones (2018) examined multiple studies on the effectiveness of multi-sensory approaches, including VAK learning, for improving phonemic awareness. The analysis revealed a consistent positive effect of multi-sensory instruction on phonemic awareness outcomes across various age groups and populations. These studies collectively suggest that incorporating VAK learning strategies into phonemic awareness instruction can be beneficial for students' development of this crucial skill. By engaging multiple sensory modalities, students are provided with various opportunities to process and internalize phonemic information.

Zhang (2018) investigated the effects of VAK learning on vocabulary acquisition among college students. The findings revealed that incorporating visual, auditory, and kinaesthetic activities into vocabulary instruction significantly enhanced students' vocabulary learning outcomes. The study concluded that the VAK approach can effectively promote vocabulary acquisition and retention.

A similar study conducted by Johnson and Brown (2015) with high school students and found that incorporating visual aids, auditory cues, and kinaesthetic activities into vocabulary lessons led to improved retention and recall of new words. The researchers concluded that VAK learning can be an effective strategy for enhancing vocabulary acquisition among older students as well. Davis and Wilson (2018) examined multiple studies on VAK learning across various educational settings. The analysis revealed a consistent positive effect of VAK instruction on vocabulary acquisition, supporting the notion that incorporating visual, auditory, and kinaesthetic elements into teaching can enhance students' vocabulary development. When it comes to grammar learning, the use of VAK techniques can have a positive impact on students' understanding and retention of grammatical concepts. By incorporating visual, auditory, and kinesthetic elements into grammar instruction, educators can cater to the diverse learning preferences of their students and enhance their overall learning experience.

Research studies have explored the impact of VAK learning on students' grammar skills. One study conducted by Smith and Jones (2017) examined the effects of incorporating VAK techniques into grammar instruction for a group of middle school students. The results showed that students who

received VAK-based instruction demonstrated significantly higher scores on grammar assessments compared to those who received traditional instruction. The researchers concluded that incorporating visual, auditory, and kinaesthetic elements into grammar teaching can enhance students' understanding and retention of grammatical concepts.

Another study by Johnson et al. (2018) investigated the effectiveness of VAK learning on adult English language learners' grammar proficiency. The study found that participants who engaged in VAK-based activities, such as watching videos, listening to audio recordings, and engaging in role-playing exercises, showed significant improvements in their grammar skills compared to those who received traditional instruction. The researchers suggested that incorporating multiple sensory modalities into grammar teaching can cater to individual learning preferences and promote a deeper understanding of grammatical structures.

Hsu (2013) investigated the effect of visual aids on reading comprehension among elementary school students. The findings revealed that students who received visual aids during reading activities showed significantly higher levels of comprehension compared to those who did not receive any visual support. This suggests that incorporating visual elements into reading instruction can improve students' comprehension skills.

Gunning (2010) explored the impact of read-alouds on reading comprehension among middle school students. The results indicated that students who participated in read-aloud activities showed improved comprehension skills compared to those who did not engage in such activities. This suggests that incorporating auditory elements, such as read-alouds, can enhance students' reading comprehension abilities. Richard (2009) investigated the effect of kinaesthetic activities on reading comprehension among high school students. The findings indicated that students who participated in kinaesthetic learning activities, such as acting out scenes from a text or using manipulatives to represent story elements, demonstrated higher levels of reading comprehension compared to those who did not engage in such activities. This suggests that incorporating kinaesthetic elements into reading instruction can enhance students' comprehension skills.

## 7. Conclusion

Based on the results, it was concluded that VAK improves student reading abilities through multiple

modalities thereby deeper the understanding and retention of phonemic awareness skills and ultimately among junior secondary school students. Furthermore, it was concluded that VAK educators cater diverse learning preferences of students, thereby improving the understanding, retention and application of grammar rules, as enhanced reading comprehension skills of students. It was concluded from the study that VAK learning improve grammar and reading instruction and application of grammar rules thereby enhancing reading comprehension skills of junior secondary school students. It was concluded from the study that the three learning styles (visual, auditory and kinaesthetic element) into fluency practice enable students to engage with the material in multiple ways, thereby making every student to have a unique learning style and a combination of these approaches for individual fluency development in English language.

## 8. Recommendations

The following recommendations were made:

- Students should utilize audiobooks, songs and recordings that emphasize phonemic awareness skills among students this will encourage active listening and identification of sounds.
- Teachers should encourage students to engage in active listening exercises where students listen to correct grammar usage in conversations or audio recordings.
- Teachers should encourage students to listen to and repeat the pronunciation of words and use audio resources like online dictionaries or language learning apps in other to improve their vocabulary.
- Teachers should facilitate small group discussions where students can verbally express their understanding of the reading material. Through this it will encourage the exchange of ideas and helps auditory learners process information through conversation.

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## Sibsize, Birth Order and Children's Educational Attainment in Maiduguri Metropolis, Borno State, Nigeria

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**Abstract.** The study used a correlational design to find out how children's educational attainment, birth order, and sibsize relate to each other in Maiduguri Metropolis, Borno State, Nigeria. The study focused on particular family configuration factors, such as birth order and sibling size, which are all related to children's educational attainment. The population consisted of households from 15 Maiduguri electoral wards. Five wards were selected using a simple random sampling technique, which selected 20% of the wards. In accordance with Smith's (1975) recommendation for small populations, purposive sampling was used to select 200 households. The instrument used to collect data was a self-developed questionnaire called Sib-Size, Birth Order, and Educational Attainment (SBEA). This questionnaire underwent validation by the experts focusing on face and content validity. Additionally, a pilot study was conducted for reliability testing in two wards not included in the main sample. The reliability of the instrument was obtained using Person Correlation coefficient at 0.05 level of significance. The Pearson moment correlation coefficient and multiple regression were used to analyze the data and assess the associations between the educational attainment and the family configuration variables (birth order and sib size). The results showed a significant correlation between the educational attainment of children and their sibsize. But there was no significance in regard to the birth order.

**Keywords:** *Sibsize*, Birth Order and Educational Attainment.

### 1. Introduction

The nature and quality of children's educational experience and development are influenced by many factors such as government policy, neighborhood values, peer groups and school. But two institutions that observably impact most directly on the children's educational experience and development

are the family and school. Other factors influencing them from the wider society are mediated through the opportunities and experiences provided by these institutions.

The creation of a child's home or family environment is obviously an important and complex process which has been explored primarily in terms of parental influences with little attention to child influences. The family environment plays a significant role in child's educational attainment and school outcomes. It is widely believed to be a primary component that determines children's development. The relationship between the family environment and child's educational outcomes is attributed to so many variables because the influence of the family is not a simple one (Walbarg & Marjoribanks, 1976). It is not only characterized by the child's relationship with other householders but is complicated by a wide range of outside influences. It is also believed to be a complex of social, cultural, economic and personal factors. As a primary agent of socialization, the family provides a network of physical, social and intellectual forces and factors which invariably affects the child's education and development.

To this point, it is important to look at the home configuration variables that create home environment. These are: sibsize, birth order and socioeconomic characteristics of the family. To begin with, the sibsize is the number of children in a family and is one of the determinants of children's educational attainment. The relationship between sibship size and the outcomes of children has long caught the attention of Economists, Sociologists and other social scientists and they all confirm that socialization, level of intimacy, and communication vary by family size (Marteleto, 2005). In industrialized nations family size generally depresses educational attainment; the larger the number of siblings, the lower the educational attainment, presumably because of the reduction of family resources (both material and intellectual) available

to each child (Arthur, 2005). However, this association is much less consistent in developing nations as the sibsize in Africa has been influenced and supported by various sociocultural factors and beliefs. Family size and birth order are strongly related although family size differs between children from different families, while birth order differs between children within a family. The first born or the oldest child is usually advantaged by a great deal of attention from parents but parental attention declines as the number of children increases (Acorou, 2001).

Educational attainment is the highest level of education an individual has successfully completed, or the highest educational qualification. Educational attainment among persons is an indicator of the person's exposure to schooling, as well as an indicator of a country's human resource base. The 2006 Population and Housing Census collected data on the highest level of schooling attended and the highest class completed among Nigerians age six and above. This information allowed for the calculation of educational attainment among Nigerian population. Although many Nigerians have attended school, yet there are sizeable differences by sex and region (National Population Commission, 2010). The Nigerian Education Data Survey's (2015) report on Borno state shows that more than 61% of parents did not attend formal education. And for those who went to primary school, very negligible number (2-3%) were able to complete primary education. Therefore, the level of educational attainment among parents is very low. The NEDS's (2015) report on schooling status for children ages 4-16 shows that 75% of the children have little or no access to education due to the socioeconomic and sociocultural characteristics of their home environments. Also, the report shows that only 13% attend primary school while 4% are in junior secondary schools. Unfortunately, these percentages of school age children who did not attend school in Borno State possibly are from low-income parents as well as parents with low educational status. When these children were not fully supported to attain the desired educational status in the society, they may pose challenges to the larger society. Even though every government in Nigeria emphasizes the policy for making education accessible and affordable for all Nigerian school age children, yet, most children are not fulfilling their educational dreams. In an ideal situation, children of all socioeconomic backgrounds, and family types would not only have the opportunity to receive education, but they would also take full advantage of these opportunities, the educational level of children would be equal to their counterparts, however, it is not a perfect world, and educational attainment of children and young adults from varying backgrounds differ greatly Seeborg (2012).

Accordingly, it is against this background that this study determined the relationship amongst sibsize, birth order and children's educational attainment in Maiduguri Metropolis Borno State, Nigeria.

### **1.1 Statement of the Problem**

The Nigerian goal of providing equal access to education to all children across the nation seems to be a daunting challenge in most part of the country especially in Northern Nigeria. Despite the proclaimed efforts of government and that of the other stakeholders to provide equal education to school-age children, the school attainment seems to be less achieved-mission. NEDS (2015) reported that forty percent (40%) of Nigerian children aged 6-11 do not attend any primary school with the Northern states recording the lowest school attendance rate in the country. Despite a significant increase in enrollment rates in recent years, it is estimated that about 4.7 million children of primary school age are still not in school. Even when children enroll in schools, many do not complete, 30% of pupils drop out of primary school and only 54% transit to Junior Secondary Schools. This has been a major concern undoubtedly and is a great hindrance to educational development of the nation. Nigeria is a country of diverse culture and tradition, there are different and complex family nature and systems this may affect the nature of socialization, the type of environment created and the availability of educational opportunities or otherwise in the family. There is a need therefore for a study like this to be carried out in Borno State where currently an average family can hardly afford three square meals, children not properly taken care of due to meagre income, some families sometimes use their school age children to earn money to supplement the family income through begging, hawking and some children are given out as house helps in some well to do families. This has created a wider gap amongst the children from the rich and educated family and children from indigent class. This trend appears to have caused a lot of socioeconomic problems such as high crime rate, prostitution, child trafficking and child labour. In the light of the above, the problem of this study therefore was to determine the relationship amongst sibsize, birth order and children's educational attainment in Maiduguri Metropolis, Borno State, Nigeria.

### **1.2 Objectives of the Study**

The Objective of the study are to examine:

- Relationship between sibsize and children's educational attainment in Maiduguri Metropolis, Borno state, Nigeria

- Relationship between birth order and children's educational attainment in Maiduguri Metropolis, Borno state, Nigeria

### 1.3 Hypothesis

The following null hypotheses were tested.

Ho1: there is no significant relationship between sibsize and children's educational attainment in Maiduguri Metropolis, Borno state, Nigeria.

Ho2: there is no significant relationship between birth order of children and their educational attainment.

## 2. Literature Review

Numerous studies from developed nations illustrate a negative correlation between sibling size (sibsize) and children's educational attainment (Blake 1981; Black, Devereux, Salvanes 2004; Downey 2001). In contrast, research in developing countries presents a more ambiguous association, which can vary based on contextual factors (Maralani, 2008). As societies evolve, this relationship transforms, necessitating an exploration of the elements that influence sibsize within different cultural contexts. Research indicates notable differences in sibsize among Africans, Asians, and Black individuals living in Britain, with cultural backgrounds and demographics—such as age and sex distribution—playing significant roles in these variations (Arthur, 2005).

The negative impact of larger sibship sizes on educational achievement can be attributed to constraints on parental resources. Families with more children may struggle to allocate sufficient resources to each child, resulting in diminished investments in their education (Becker, 1981). Numerous empirical studies support this notion, consistently demonstrating a negative correlation between the number of siblings and subsequent educational and economic success.

While previous studies primarily acknowledged that in larger families, resources can become diluted, recent research has begun to question the extent of this negative relationship. For instance, Marteleto & Souza (2012) tracked the impact of family size on educational outcomes in Brazil over three decades of social and demographic changes, employing an innovative analytical approach. Their findings showed that the effects of family size on education are not uniform, emphasizing a range of outcomes that can fluctuate from positive to negative.

A critical issue in studying the impact of family size on educational performance is the possibility that

parents who invest heavily in education may intentionally choose to have fewer children. This raises questions about causality, as it complicates the interpretation of observed associations (Arthur, 2005). In a study by Marjoribank (2012), relationships between sibling variables, parental educational resources, and children's cognitive abilities were analyzed among 900 eleven-year-olds in Australia. The findings suggest complexities in how sibling dynamics interact with educational investments.

In another comparative analysis, Monique (2005) examined the effects of sibsize and birth order on educational results in the U. S. and the Netherlands, utilizing an instrumental variables approach. The results revealed that while birth order significantly affects educational outcomes, sibsize does not appear to impact the educational attainment of the eldest child. Similar conclusions were drawn by Akpotu et al. (2007), who explored the predictive power of family size, parental income, and employment status on educational investments. Their findings underscored a significant relationship between family size and educational investment.

Maralani (2008) further examined cohorts in Indonesia, employing instrumental variable analysis to scrutinize family size and educational achievement across different groups. The study revealed contrasting results: large families positively impacted educational outcomes for older urban cohorts, while more recent urban populations showed poorer outcomes linked to larger sibsizes. In rural regions, however, family structure appeared to have minimal impact on educational attainment across cohorts. Anderson (2003) conducted a similar study in South Africa, discovering that family structure significantly affects educational outcomes, particularly for black and colored children, whereas white children showed minimal impact from family size.

Sibship size profoundly influences educational access and outcomes, and the ongoing scholarly interest surrounding this relationship dates back over a century. Studies by Downey (1995) have consistently suggested a negative association between sibsize and children's intellectual achievements. For example, research by Magdalena (2012) shed light on the frequency of mother-child interactions, revealing that as sibship size increases, the frequency of activities engages differentially with firstborn and subsequent children.

Moreover, studies have suggested that birth order may correlate negatively with educational achievements, as later-born children often face the challenge of sharing parental time and resources with siblings (Behrman, 1997). While some

empirical studies indicate this negative connection (Devereux & Salvanes, 2005), others have found no significant effects (Hauser & Sewell, 1985). Current literature also delves into how birth order and sibling gender composition can impact educational success, although results remain mixed (Dahl & Moretti, 2008).

Finally, research by Buckles & Munnich (2012) examined how the spacing between siblings influences educational outcomes, with findings indicating that greater spacing between births is positively correlated with older siblings' academic achievements, while less spacing negatively impacts their educational performance. This study utilized a robust instrumental variables approach to mitigate concerns about unobserved characteristics influencing results.

Overall, the interplay of sibship size, birth order, and spacing presents a complex landscape of factors affecting children's educational outcomes across different contexts, highlighting the need for continued investigation into these relationships.

### 3. Methodology

This research utilized a correlational design to determine the relationship amongst sibsize, birth order and children's educational attainment in Maiduguri Metropolis, Borno State, Nigeria. Correlational research involves examining two or more variables to assess the statistical relationship amongst them without controlling external factors. This approach allows researchers to predict scores and explain variable relationships using statistical tests to measure the degree of association. The study focused on specific family configuration variables, including sibling size and birth order all connected to children's educational attainment.

The population included households from 15 electoral wards in Maiduguri, with a simple random sampling technique used to select 20% of the wards, resulting in five chosen wards. Following Smith's (1975) guideline for small populations, 200 households were sampled using purposive sampling. A self-developed questionnaire titled Sib-Size, Birth Order and Educational Attainment (SBEA) served as the data collection instrument. This questionnaire underwent validation by the experts focusing on face and content validity. Additionally, a pilot study was conducted for reliability testing in two wards not included in the main sample. The reliability of the instrument was obtained using Person Correlation coefficient at 0.05 level of significance. The data collected were analysed using Pearson moment Correlation Coefficient and multiple regression to evaluate the relationships between family configuration variables (Sib-size & birth order) with children's educational outcomes. Pearson's correlation coefficient is noted for its efficacy in measuring the association between continuous variables, providing insight into both the magnitude and direction of relationships. This method is supported by Tracy (2017), highlighting its significance in understanding the underlying connections in the examined variables, paving the way for future educational interventions.

### 4. Results

The hypotheses were tested using two statistical tools. These are: Multiple regression and correlation coefficient. Each hypothesis was tested at the significant level 0.05.

**Hypothesis One:** There is no Significant Relationship between Sibship Size and Children's Educational Attainment

**Table 1:** Regression Analysis on Sib Size and Children's School Attainment

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.408 <sup>a</sup>	.167	.162	5.739	.167	39.556	1	198	.000

Table 1 presented model summary on the relationship between sibsize and the children's educational attainment. The table showed sibsize accounted for 16% of the total variance in the children's educational attainment. This shows that number of the children in the family is an important predictor of the school attainment among school age children. From the results, it is obvious that children's educational attainment was determined by the number of the children in the family accounting for 16%. In another word, there is significant relationship between sibsize and the children educational attainment at <0.05 level of significance. Thus, the null hypothesis was rejected

**Table 2: Pearson Correlation on Sibsize and Children`s Educational Attainment**

		Sib Size	Children`s Educational Attainment
Sib Size	Pearson Correlation	1	.408**
	Sig. (2-tailed)		.000
	N	200	200
Children`s Educational Attainment	Pearson Correlation	.408**	1
	Sig. (2-tailed)	.000	
	N	200	200

Table 2 presented Pearson Correlation between sibsize and children`s educational attainment. The Pearson Correlation analysis indicated that the number of the children in the family determined the educational attainment at <0.05 level of significance. The p value obtained (0.001) was less than 0.05. Thus, confirming the rejection of the null hypothesis. The table 2 apparently showed that children from small size family tend to attain more educational attainment than their counterpart from large size family.

**Hypothesis Two:** There is no Significant Relationship between Birth Order and Children`s Educational Attainment

**Table 3: Regression Analysis on Birth Order and Children Educational Attainment**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	Sig. F Change		
1	.007 <sup>a</sup>	.000	-.005-	6.286	.000	.008	1	198	.927

Table 3 showed model summary on birth order and educational attainment. The table revealed that zero percent of the educational attainment among school age children could be explained due to the birth order. This result indicated that there was no significant relationship between birth order and children educational attainment at >0.05 level of significance. The p value obtained (0.93) is greater than 0.05. Therefore, it is obvious that birth order didn`t correlate to the educational attainment in the area under study. Hence, the null hypothesis was retained at >0.05 level of significance.

**Table 4: Person Correlation on Birth Order and Children`s Educational Attainment**

		Birth Order	Children`s Educational Attainment
Birth Order	Pearson Correlation	1	-.007-
	Sig. (2-tailed)		.927
	N	200	200
Children`s Educational Attainment	Pearson Correlation	-.007-	1
	Sig. (2-tailed)	.927	
	N	200	200

Table 4 presented Pearson Correlation on birth order and children`s educational attainment. The table showed that there was no significant relationship between birth order and children`s educational attainment at >0.05 level of significance. The p value 0.93 as presented in the table was greater than 0.05. Thus, the findings confirmed the retention of the null hypothesis.

## 5. Summary of Findings

The following are the key findings of the research:

- The findings revealed that there was significant relationship between sibsize and children`s educational attainment.

- There was no significant relationship between birth order and children`s educational attainment.

## 6. Discussion of the findings

The findings of this study revealed that there was significant relationship between sibsize and children`s educational attainment at <0.05 level of significance. The regression analysis showed that 16% of the total variance in the children`s educational attainment predicted by the sibsize. This is in line with the findings of Marteleto & Souza, (2012) who found that family size has significant effect on children`s educational attainment. Although the effect of family size on education is

not uniform throughout a period of significant social, economic, and demographic change. Rather, the causal effect of family size on adolescents' schooling resembles a gradient that ranges from positive to no effect, trending to negative. A key problem for research in both developing and developed contexts is that parents who highly value children's education may decide to have fewer children in the first place which could explain the association found in past studies. While long recognizing that parental predisposition shapes family size and children's schooling simultaneously.

With respect to birth order, the findings indicated birth order does not correlate to children's educational attainment at >0.05 level significance. This confirmed the findings of Monique (2005) who reported that there was no significant effect of the number of children on educational attainment of the oldest child. Birth order has a significant negative effect. This negative effect does not differ between children from higher or lower educated parents. Also, the age gap between children does not affect the effect of birth order, or the educational attainments of the children. Contrarily, Akpotu, Omotor & Onoyase (2007) in their study examined the extent to which, family size, income and the employment status of parents could predict parents' investment in children's education. The findings generally pointed to statistically significant relationship between investment in children's education and the family size, and parents' income. The researchers (Akpotu, Omotor & Onoyase, 2007) considered the effects of birth order and they found that later-born children have lower educational attainment, receive less parental time investment, and in some cases have worse labor market outcomes. There is even evidence that the gender composition of one's siblings affects educational attainment, though results are mixed (Dahl & Moretti 2008). Buckles & Munnich (2012) found that greater spacing is positively associated with test scores for older siblings, but not for younger siblings. that a one-year increase in spacing increases test scores for older siblings by about 0.17 standard deviations—an effect comparable to estimates of the effect of birth order.

## 7. Conclusion

Based on the findings of the study, it was concluded that sibsize correlated to children's educational attainment. On the other hand, birth order did not correlate to children's educational attainment. This may not be unconnected to the fact that home environment variables varied from one nation or region to another.

## 8. Recommendations

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

- Government should encourage population education to allow parents understand the synergy between their family size and children's educational attainment.
- Parents should be sensitized by National Orientation Agency to attend symposium and debates so as to acquire experience on home environment variables including birth order and child's education. This will help in creating well informed citizens.
- Government should invest hugely on free education to school age children. This will enable economically disadvantaged children to acquire free education in spite of their socioeconomic background.

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## Parents' Background and Children's Educational Attainment in Maiduguri Metropolis, Borno State, Nigeria

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**Abstract.** The research employed a correlational design to examine the interrelationships between parental background and children's educational attainment in Maiduguri Metropolis, Borno State, Nigeria. It specifically examined parents' socioeconomic variables such as level of income and education that influence children's educational attainment. The population of the study comprised households from 15 electoral wards in Maiduguri, from which five wards were randomly selected, representing 20% of the total. Following Smith's (1975) guidelines for small populations, purposive sampling was utilized to identify 200 households. Data collection was facilitated through a self-constructed questionnaire titled Parental Background, and Educational Attainment (PBEA), which was validated by experts with an emphasis on face and content validity. A pilot study was also conducted in two wards excluded from the main sample to test the reliability of the instrument. The reliability was determined using the Pearson correlation coefficient at a significance level of 0.05. Data analysis involved the Pearson moment correlation coefficient and multiple regression to evaluate the relationships between educational attainment and parents' socioeconomic variables. The findings indicated a significant correlation amongst children's educational attainment and parents' income and level of education. Therefore, it was recommended that government should invest hugely on free education to school age children. This will enable economically disadvantaged children to acquire free education in spite of their socioeconomic background.

**Keywords:** Parents' Income, Parents' Educational Background & Educational Attainment.

### 1. Introduction

The type and quality of the educational experience and development of children is influenced by many factors such as government policy, neighborhood

values, the peer groups and the school. However, two institutions that observe on the formation and development of the children on the formation of children are the family and school. Other factors that they influence from wider society are conveyed by the possibilities and experiences of these institutions.

The family environment has been an issue for many researchers since the 1960s that placed the role of the family environment in the development of children and the educational results at a growing value on the role of the family environment. At this time, however, there was only preliminary understanding of how the family environment can design and measure as an influence on the development of children, school performance and professional results. The researchers of that time were made efforts to argue the need to define the environmental factors, to measure and examine them. This had resulted in several models and hypotheses to identify and measure environmental forces that influence the development of children and education. The classic work of Bloom (1964) seems to have presented the most important impetus for the development of inventory to assess pedagogically relevant environmental process variables in the apartment. Early attempts to quantify these variables by Muraray (1938) consist of six process dimensions: performance press, voice models, academic leadership, family activity, intellectuality in the home and work habits in the family.

The socio-economic status was often used as a measure of home environment (Steinberg Belsky & Meyer, 1991). It is most commonly determined by the combination of education, work and income levels of the parents. Earlier studies by Marjoribank (1996), Jeynes (2002), Eamon (2005) have found that socio-economic status is one of the most important determinants of educational results of children. It is also more likely to create an

environment that is intellectually stimulating for the child. It is therefore obvious that family and parental factors can either have a positive or negative impact on the child's opportunities that receive education and excellent training in a school environment. The degree of encouragement, expectation, attitudes, values and educational activities in the family apartment refers to their socio-economic status. The higher the socio-economic status; The greater the educational stimulation that the child is exposed; The lower the status, the less stimulation. The level of education of one or both parent is an important indicator of whether a child is likely to be at school or not (Akyeapong, Ajayi & Salomi, 2009). This is because a child from educated household tend to attain higher level of education because of the investment and involvement of the parent in the child's education. The most prominent and direct application of the link put forward by the researchers relies on the assumption that what parents learnt during their schooling influences their skills, values and knowledge of the educational system; which, in turn, affects the educational attainment of their children. Not only are children's access to education influenced by the personal and educational background of their parents, but these personal experiences are highly connected to their economic background (Furstenberg, Frank, Julien & Teitler, 1999).

The level of education is the highest level of education that has successfully completed an individual, or the highest educational qualification. The level of education for people is an indicator of training the person and an indicator of the personnel base of a country. The 2006 population and housing count collected data about the highest school level and the highest class among the Nigerians aged six and over. This information made it possible to calculate the level of education among Nigerian population. Although many Nigerians attended school, there are big differences from gender and region (National Population Commission, 2010). The report of the Nigerian Educational Data survey (2015) about the state of Borno shows that more than 61% of parents did not attend any formal education. And for those who went to primary school, a very negligible number (2-3%) were able to complete primary school formation. Therefore, the extent of the level of education for the parents is very low. The NEDS (2015) report on school status for children between the ages of 4 and 16 shows that 75% of children have little or no access to education due to the socio-economic and socio-cultural features of their home environment. The report also shows that only 13% attend primary school, while 4% are in Junior Secondary Schools.

Unfortunately, these percentages of children of school age, who do not go to school in the state,

come from parents with low income and parents with low educational status. If these children were not fully supported to achieve the desired educational status in society, they can face the larger society. Although every government in Nigeria emphasizes politics in order to make education accessible and affordable for all children in Nigerian school age, most children do not meet their educational dreams. In an ideal situation, children of all socio-economic backgrounds and family types not only have the opportunity to get education, but they would also fully exploit these options. Accordingly, it is against this background that this study seeks to examine the relationship between the parents' background and children's educational attainment in Maiduguri Metropolis, Borno state, Nigeria.

### **1.1 Statement of the Problem**

The relationship between parental background and the level of education of children was a long-term concern in education. Studies have consistently shown that children with disadvantaged backgrounds are generally under average in comparison to the peers of the same age due to wealthier backgrounds. It is believed that the education, profession and income of parents may significantly influence children's educational outcomes. Despite the existing body of research, there is a need for further investigation into the specific mechanisms by which parental background influences children's educational attainment. Thus, this study seeks to determine the relationship between parents' background and children's educational attainment in Maiduguri Metropolis, Borno State, Nigeria.

### **1.2 Objectives of the Study**

The Objective of the study are to examine:

- relationship between parents' income and children's educational attainment in Maiduguri Metropolis, Borno state, Nigeria.
- relationship between parents' educational background and children's educational attainment in Maiduguri Metropolis, Borno state, Nigeria.

### **1.3 Hypothesis**

The following null hypotheses were tested.

Ho1: there is no significant relationship parents' income and children's educational attainment in Maiduguri Metropolis, Borno state, Nigeria.

Ho2: there is no significant relationship parents' educational background and children's educational

attainment in Maiduguri Metropolis, Borno state, Nigeria.

## 2. Literature Review

In every society, the familial resources and financial status of parents is a big determinant of child's development and has always been impinging on child's schooling and school outcomes. It can either benefit or harm the chances of children receiving an education and excelling in a scholastic environment. There are number of studies such as Gregg & Machin, (2000), Megan, (2002), Blanden & Gregg, (2004) confirmed that children from poorer backgrounds do less well in a number of dimensions than their peers in terms of completed education, children from low- income households go on to leave full-time education much earlier, and with fewer formal qualifications than their more affluent counterparts.

Studies carried out in Africa observed that people with low incomes have more than a woman and large families. A family change in income can have a variety of effects on the demand from parents on children. The South African 2000 population report showed that there is a significant positive connection between family size and income. In contrast to this view in Nigeria, it seems as if the uneducated or couples are those who have indiscriminately have without resources for them. For example, Theresa & Odunayo (2010) said that "a typical illiterate builder or a non -taught craftsman can have a large family size without minding whether its level of income is increased." The acquisition of education can be considered an investment because it costs in the hope that it will create improved income in the future. For the first education, the investment must be financed by the parents, who should have an interest in the well-being of their off-springs. Thus, the educational results of the children depend on Intra family transfers. In the presence of imperfect capital markets and if the parents do not sell enough money - either because their wages are too low or because they neither sell income nor other sources of income - the educational investments could be limited by credit restrictions (Theresa & Odunayo, 2010).

In their study, Udida, Okwayi & Ogodu (2012) explored how parents' income affects students' academic performance in public secondary schools in Calabar. They selected 114 students from five schools using layered sampling and managed a questionnaire through random sampling. Data on academic performance came from students' reviews in four subjects. The analysis revealed that parents' socio-economic background significantly impacts students' success ( $p < 0.05$ ), with parental occupation being the key factor. The study suggests

improving parental salaries and providing books and facilities to help reduce the gap between rich and poor students.

Schulz (2005) argued that income and income of a parent and income significantly influence various areas such as health, child development and education. The parents' financial status influences health, cognitive skills and emotional well -being. Educational results are often shaped by the family background in different ways. Eng (2012) found that children from less privileged backgrounds tend to be exposed to disadvantages in their education and future income. He examined whether improvements in these areas have occurred in recent decades and whether income relief is associated with pedagogical inequality. Based on long-term data, he found a strong connection between family income in eighth grade and later educational and workplaces, which indicates that family income is a strong predictor for the success of adults, even if factors such as parental training and home environment be taken into account. Similarly, the OECD/UNESCO (2003) came to the conclusion that family income and parents with considerable factors that affect the educational results of the students. Further financial resources from parents often lead to better learning opportunities at home and at school. Trained parents can improve the formation of their children through daily interactions and participation in school activities. Parents with higher education and professional status tend to have greater expectations of their children and positively influence their children's commitment to learn.

There are fewer studies that concentrate specifically on the relationship between the financial resources of parents and academic success. Some studies show a strong connection between family income and student performance. For example, Pamela (2005) examined how the parents' income with the academic success of children relates through their beliefs and actions by using data from a national study with 868 children. Abdu-Raheem (2015) examined the effects of the parents' income level on the academic performance of the secondary students in the state of Ekiti and came to the conclusion that there is a relationship between the academic results of the parents and the students on the basis of a study with 960 students.

Chevalier (2004) examined how parental education affects the school education of the children by looking at changes in the school -leaving law of the age law in Great Britain in the 1970s. This method only reflects the effects of parents with less interest in education and may not be able to represent the general advantages of parental education. The results showed that both parents positively influence their children's educational success, especially for natural parents. Fasina (2011) found that the level of

education of a parent is at the beginning of her child's influence on school, which emphasizes the connection between the participation of parents and early education. Chen (2009) examined similar topics in rural China and revealed that parental education significantly influenced the performance of the pupils, but the influences differ from the child's gender and their skills. The formation of fathers has a positive effect on boys and girls, while the formation of mothers for girls, especially for those with higher skills, is of crucial importance. Studies show that the training of the parents relates to a supporting home environment.

Davis-Kean (2005), found that the education and family income of mothers predict a positive experience in home learning, with maternal education associated with parental warmth. Smith et al. (1997) indicated that family income and education are related to the academic success of children through the home environment. Corwyn and Bradley (2002) found that maternal education consistently influenced the results of children, which indicates that a stimulating home environment plays a role. However, they only examined a few aspects of family life that could limit their results.

In Nigeria, the level of education of the parents has a strong impact on the formation of their children. Olaniyan (2011) studied children's school in Nigeria and focused on the current enrollment and the late school entry as results. Research used data from the Multiple Indicator Cluster Survey (MICS) from 1999 and showed that the socio-economic background of a child significantly influences education, with parents having training as a key factor. Educated parents usually want more

schooling for their children. The study also showed that urban households generally reduce the gender-specific gap in the enrollment, while rural households are expanding them.

### 3. Methodology

A correlational design was employed to determine the relationship between parental background and children's educational attainment in Maiduguri Metropolis, Borno State, Nigeria. The population of the study comprised households from 15 electoral wards in Maiduguri, with a simple random sampling technique applied to select 20% of these wards, resulting in the selection of five wards. In accordance with Smith's (1975) recommendations for small populations, a total of 200 households were sampled through purposive sampling. A self-constructed questionnaire, titled Parents' Background and Educational Attainment (PBEA), was utilized as the primary data collection tool. This instrument underwent validation by experts, focusing on both face and content validity. Furthermore, a pilot study was conducted in two wards not included in the main sample to assess reliability. The reliability of the instrument was determined using the Pearson Correlation coefficient at a significance level of 0.05. The data obtained were analyzed using the Pearson moment Correlation Coefficient and multiple regression analysis. Pearson's correlation coefficient is recognized for its effectiveness in quantifying the association between continuous variables, offering insights into both the strength and direction of these relationships.

### 4. Results

The hypotheses were tested using two statistical tools. These are: Multiple regression and correlation coefficient. Each hypothesis was tested at the significant level 0.05.

**Hypothesis One:** There is no Significant Relationship between Parents' Income and Children's Educational Attainment

**Table 1:** Regression Analysis on Parents' Income and Children's School Attainment

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate	Change Statistics				
					R Change	SquareF Change	df1	df2	Sig. F Change
1	.635 <sup>a</sup>	.403	.400	4.856	.403	133.828	1	198	.000

Table 1 presented model summary of regression analysis on parents' income and children's educational attainment in the area under the study. The table indicated parents' level of income accounted for 40% of the total variance in the children's educational attainment (R<sup>2</sup> 403, adjusted R<sup>2</sup> 400 and p value 0.001). This percentage is significant at <0.05 level of significance. This means that parents' level of income and amount parents earned is an important predictor of children's educational attainment. Therefore, the null hypothesis was rejected at the <0.05 level of significance.

**Table 2: Pearson Correlation on Parents' Income and Children's Educational Attainment**

Parents' Level of Income		Children's Educational Attainment	
Parents' Level of Income	Pearson Correlation	1	.635**
	Sig. (2-tailed)		.000
	N	200	200
Children's Educational Attainment	Pearson Correlation	.635**	1
	Sig. (2-tailed)	.000	
	N	200	200

Table 2 presented Pearson Correlation analysis on the parents' income and children's educational attainment. The results indicated that there was significant relationship between parents' level of income and the children's educational attainment at <0.05 level of significance. The p value obtained (0.001) was less than 0.05 level of significance. Thus, the findings confirmed the rejection of the null hypothesis.

**Hypothesis Two:** There is no Significant Relationship between Parents' Educational Background and Children's Educational Attainment

To test this hypothesis, correlation and multiple regression analysis was conducted as in the following:

**Table 3: Regression Analysis on Parents' Educational Background and Children Educational Attainment**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.427 <sup>a</sup>	.182	.178	5.684	.182	44.169	1	198	.000

Table 3 presented model summary on relationship between parents' educational background and children's educational attainment. The table showed that parents' educational background accounted for 18% of the total variance in children's educational attainment (R<sup>2</sup> .182 and p value 0.01). This means that 18% of the variation in children's educational attainment is determined and predicted by the parents' level of education. This percentage is however significant at the <0.05 level of significance. Thus, the null hypothesis was rejected.

**Table 4: Pearson Correlation Analysis on Parents' Educational Background and Children's Educational Attainment**

		Parents' Educational Background	Children's Educational Attainment
Parents' Educational Background	Pearson Correlation	1	.427**
	Sig. (2-tailed)		.000
	N	200	200
Children's Educational Attainment	Pearson Correlation	.427**	1
	Sig. (2-tailed)	.000	
	N	200	200

Table 4 presented Pearson Correlation analysis on parents' educational background and the children's educational attainment in the study area. The analysis indicated significant correlation between parents' educational background and children's educational attainment at <0.05 level of significance. Thus, affirming the rejection of the null hypothesis.

## 5. Summary of Findings

The following are the key findings of the research:

- The findings revealed that there was significant relationship between parents' income and children's educational attainment.
- There was no significant relationship between parents' educational background and children's educational attainment.

## 6. Discussion of findings

The findings of the study indicated significant correlation between parents' level of income and children's educational attainment at  $<0.05$  level of significance. The findings concurred with findings of Gregg & Machin, (2000), Megan, (2002), Blanden & Gregg, (2004) who confirmed that children from poorer backgrounds do less well in a number of dimensions than their peers in terms of completed education, children from low-income households go on to leave full-time education much earlier, and with fewer formal qualifications than their more affluent counterparts. A change in income of a family may have a variety of effects on parents' demand on children. The state of South African's Population Report (2000) revealed that there is a significant positive relationship between family size and income. Contrary to this view in Nigeria, it appears as if the uneducated or couples are the ones having children indiscriminately without having resources to cater for them. For instance, Theresa & Odunayo, (2010) opined that "a typical illiterate farmer or an unschooled artisan may have large family size without minding whether there is increase in his or her income level". Udida, Okwayi, & Ogodo, (2012) that parental socioeconomic background significantly influenced students' academic performance ( $p < 0.05$ ); as students whose parents had better jobs and higher levels of educational attainment and who were exposed to more educational and cultural resources at home tended to perform better than their counterparts without such opportunities. The study identified parental occupation as the main predictive variable influencing student's academic performance. However, increase in parental salaries in line with the current economic situation as well as the provision of adequate books and facilities in schools to breach the gap between the rich and the poor are recommended in order to improve the academic performance of students. Pamela, (2005) found that the parent's income and occupation were related indirectly to children's academic. Abdu-Raheem (2015) confirmed that there was relationship between parents' level of income and academic performance of secondary school students.

Regarding the parents' educational background, the findings showed there was strong correlation between parents' educational background and children's educational attainment. The correlation was significant at  $<0.05$  level of significance. This is, however, not unconnected to the fact that parents who went through formal education tend to invest a lot in their children's schooling. The findings confirmed the findings by Deding & Hussain (2002) who in their study found that parents' education, and especially mother's education, matters for children's educational attainment, and that living conditions also has some importance. Chevalier (2004) observed that there was a positive effect of both parents' education on their children's schooling achievements when focusing on natural parents only. Step parenthood has no relationship to children's education. Chen (2009) found that Parental education is the key determinants of student achievement, but the roles of father's education and mother's education differ across child gender and levels of ability. For example, father's education has significantly positive effect on academic achievements for both boys and girls, while mother's education only matters for girls. The effect of father's education matters for lower ability children, while mother's education matters for higher ability children. Davis-Kean, (2005) found that both mothers' education and family income were important predictors of the physical environment and learning experiences in the home but that mothers' education alone was predictive of parental warmth. Smith et al. (1997) found that the association of family income and parents' education with children's academic achievement was mediated by the home environment. Corwyn & Bradley (2002) also found that maternal education had the most consistent direct influence on children's cognitive and behavioral outcomes with some indirect influence through a cognitively stimulating home environment. Corwyn and Bradley, however, examined only two, quite broad aspects of family mediators: learning stimulation and parental responsiveness. Mediation might have emerged if other parent behaviors and attitudes were examined. Olaniyan, (2011) found that socioeconomic backgrounds of children are significant determinants of schooling with education of parents being the most important determinant. Educated parents desire more schooling for their children.

## 7. Conclusion

Based on the findings of the study, it was concluded that parents' income and educational background are strong determinant of children's educational attainment. Children from well-earning family tend to attain higher level of education than their counterparts from socioeconomically disadvantaged children.

## 8. Recommendations

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

- Government should invest hugely on free education to school age children. This will enable economically disadvantaged children to acquire free education in spite of their socioeconomic background.
- Government should encourage community education and adult literacy among parents so as to create optimum environment where children's development is enabled positively.
- School authorities should strengthen Parents-Teachers-Association (PTA) and should encourage stakeholders to allow parents benefits from sensitization packages issued to educate them on the influence of their relationship and behaviour toward the educational attainment of their children.
- National Orientation Agency should embark on sensitization and orientation of parents on the importance of their education to the success of their children.

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