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EDITORIAL NOTE

I have the delight and privilege to write as Editor-in-chief of the *Rima International Journal of Education (RIJE)*, an official research publication of the Faculty of Education, Sokoto State University. This edition (Volume 4: No. 5) of the *RIJE* has twenty-eight (28) articles from distinguished scholars and educators, poised to report cut-edge research findings and discourse on contemporary educational issues with implications for pedagogy, national and global development.

The dictum of “publish or perish” is in vogue in any worthwhile research-based institutions, hence strict adherence to publications in any reputable and recognized Journal, as such *RIJE* is recognized as complimentary to contemporary dissemination and propagation of knowledge. Therefore, the Editorial Board of *RIJE* wishes to use this medium to solicit well researched articles for publication from teeming population of academics and researchers globally. The Journal would always be subjected to thorough peer review and proper editorial vetting.

Assc. Prof. M.S. Nawait,
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Community Policing a Veritable Security Strategy for Curbing Kidnapping in Kwara State, Nigeria: Islamic Perspectives

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Abstract

Unlawful imprisoning someone and keeping him somewhere for the sake of taking ransom from the family is a threat highly discouraged in Islam while security of lives and properties is among the fundamental rights emphasized in Islam. In having high quality of security, community where people live must contribute larger percentage and otherwise the people of such community will be having security challenges. It against this background, that this study examined community policing a veritable security strategy for curbing kidnapping in Kwara State, Nigeria. The historical, analytical and phenomenological methods of research were adopted to discuss all issues that have to do with the study. The historical method was used to discuss the historical background of kidnapping in Nigeria. The analytical method was used to analysis the trends of kidnapping and modes of kidnappers' operations while phenomenological approach was used to discuss the impact of kidnapping on peoples' lives and properties in Kwara State and the use of community policing to curb the perpetrators in relation to Islamic perspectives. The findings of this study revealed that kidnapping has caused serious havoc and put unprecedented fear in the mind of people living in Kwara State. The study concluded that community policing possesses ability to reduce kidnapping operations in Kwara State, Nigeria. The study suggested that Kwara State Security Agency should intensify their efforts by providing effective and standby security officers that will be monitoring affected local government areas in the state.

Keywords: Community Policing, Security, Kidnapping, Islamic Perspectives, Curbing

Introduction

Islam is a religion that encourages any operation that can aid security of lives and properties irrespective of peoples' religion, language, tribe, colour and nation, and discourages attitudes that can threaten peoples' lives and tamper

with their properties. Numerous portions of Quran and Hadith emphasized on the needs to have effective security in the community: Allah says: *“Those who believe, and do not obscure their faith with wrongdoing, those will have security, and they are guided”* (6:82). This verse is addressing the connection between faith and security. This means that only faithful ones will promote community security. In Hadith of the Prophet Muhammad (PBUH) that: *“He who grants safety to a fearful person, Allah will grant him safety from the torment of the Day of Judgment”* (Musnad Ahmad, 12657). The Hadith is encouraging rendering safety to the people living in any given community where there is no peace regardless of religion, colour, language and tribe and Kwara State is a community on her own.

Kwara State is among the states categorized under North Central Geo-political Zone in Nigeria. In term of peace, safety and security, Kwara State is one of the peaceful states in Nigeria to the extent that the state is named state of harmony. The name was given due to high level of peace, safety and security recorded in the state since its establishment. Ilorin which is the capital of the state is globally known as home of peace. This implies that issue of insecurity is so foreign among the people of Kwara State because they have not been experiencing any dreadful and fearful situations before now. The state has diverse ethnic groups that formed from Hausa, Fulani, Yoruba, Nupe, Baruba, Baruten and others. The state is a multi-religious state that allows peaceful co-existence to reign and the people of the state are peaceful, tolerant and accommodating.

Kidnapping is a security threat designed to scatter the peaceful co-existence in all states in Nigeria including Kwara State. According to Ibrahim and Mukhtar (2017), kidnapping refers to illegal abduction of individual in order to collect unlawful ransom from the victims’ family. Soluade et al. (2025) delineated it as the process of keeping peoples in an unknown place purposely to harm the victims or collect money from their family. This is done for different purposes which include politics, religion, tribe and racism, although this merciless act is attributed to Fulani tribe in Nigeria. Maydawa (2023) explained that the communities where Nigerians live have become terrible abodes due to the high increase of insecurity in the country. Ibekwe and Alabi (2021) added that Nigeria policy force and other security agency that is expected to be a beacon of peace, safety and harmony had become unreliable people in the community due to series of injustice, corruption and impartiality attributed to them. However, citizens are encouraged to prepare themselves to rescue their people

from artificial threats of insecurity posed by unknown people who called kidnappers.

Historical Development of Kidnapping in Nigeria

Generally speaking kidnapping is not a new operation in the world. It is an operation that its existence had been confirmed in the Glorious Quran when Allah says: *“The punishment for those fight Allah and His messenger, and strive to spread corruption on earth, is that they be killed, or crucified, or have their hands and feet cut off on opposite sides, or be banished from the land. That is to disgrace them in this life, and in the Hereafter they will have a terrible punishment”* (5:33). The verse is a testimony to the existence of deviants and corruption perpetrators like kidnappers, terrorists, insurgents, and others in the history of man on the earth. However, the history of kidnapping in Nigeria could be traced back to 2006 when petroleum oil company employees were kidnapped in Delta State for the purpose of collecting money from their families. The success of the kidnappers at that time exposed notorious people in Nigeria to another source of becoming millionaire unjustly (Osolafia & Ameh, 2022). Since that period the case of kidnapping continues to gain popularity among unscrupulous citizens and non-citizens in the country to the extent that they kidnap indiscriminately. The gangs who kidnapped Salihu Tanko, and Commissioner for Information and Strategy in Niger State demanded for 100 and 1.2m Dollars respectively (Ibekwe & Alabi, 2021).

In addition, the phenomenon of kidnapping emerged from abducting government officials, religious leaders, and innocent children of prominent politicians among others in the country like joke around 2006 in Delta State (Ngwama, 2014). Furthermore, Reuter (2009) explained that the statistics of kidnapping cases in Nigeria skyrocketed to 865 cases between 2006 and 2008. This report astonished every Nigerian by them but now the phenomenon has escalated to all four corners of the country including Kwara State. There are different varieties of information spread about kidnapping phenomenon in the some local government areas in the state. A report says that the operation of kidnapping in Kwara State was centered at some local government areas like Isin, Oke-Ero, Edu, Baruten, Ifelodun and Ekiti local government areas and these local government areas are categorized under Kwara South and North parts of the state (AbdulKareem, 2025).

For instance, on the 11th February 2025 Felicia Adesina’s son was kidnapped in Omu-Aran, the headquarter of Irepodun local government area of Kwara

State. The situation was horrible and terrible with Mrs Adesina when she was called on phone to ascertain the abduction of her son. Another one was reported on June 22nd 2025 when Alhaji Dauda Ismaila was kidnapped in his residence in Edu local government area of Kwara State. The operation was carried out by heavily gunmen who sporadically releasing shouts in to the air in order to scare people away and to create fear in that community. The entire neighborhood was in serious panic and trauma since that day. (Akinyemi, 2025).

Similarly, on the June 29th 2025 the head of local vigilantes in Ifelodun local government area of Kwara State was mercilessly killed by a group of unknown gunmen (Abidoeye, 2025). Recently, on the 8th July 2025 a report showed that the operation of kidnapping got increase to the extent that in Lafiagi, the headquarter of Edu local government area of Kwara State three women were kidnapped in Kokodo and two men in Lafiagi (AbdulKareem, 2025).

From the foregoing, it is clear that kidnapping is real in Kwara State and the residents in local government areas in Kwara South and Kwara North Senatorial Districts are now in serious fear, panic and trauma.

Islamic Perspectives on Kidnapping

Islam is a religion that does not leave a single issue untouched in fact it centers much discussion on security, safety and peace. There are numerous portions of Quran and Hadith where insecurity, kidnapping, insurgency, militancy and others are expatiated for all Muslims. Among the verses where Allah discusses kidnapping are:

“Because of what We ordained for the Children of Israel: that whoever kills a person, unless it is murder or corruption on earth, it is as if he killed the whole mankind , and whoever saves it, it is as if he saved the whole mankind. Our messengers came to them with clarifications, but even after that many of them continue to commit corruption on the land” (5:32). This verse encourages peace keeping and discouraging peace breaking because it is condemning the introduction of bad practices on the earth in order to threaten members of a certain community or a group of people. Similarly, the verse stated that many people are corruption promoters as it is seen in kidnapers, militants and insurgents in Nigeria today.

In another verse, Quran says: *“And Lot, when he said to his people, “you are committing an obscenity not perpetrated before you by anyone in the whole world. You approach men, and cut off their way and commit lewdness in your gatherings...” (29:28-29).* It shows from the verse that issue of kidnapping is not a new thing in the history of man on the earth it was even introduced by the people of Lot because they by then used to block peoples’ way and prevent them from performing their daily activities.

Islam has designed punishment for practicing kidnapping, militancy and the like and the nature of punishment was spread out in the Quran as reads thus:

“The punishment for those fight Allah and His messenger, and strive to spread corruption on earth, is that they be killed, or crucified, or have their hands and feet cut off on opposite sides, or be banished from the land. That is to disgrace them in this life, and in the Hereafter they will have a terrible punishment” (5:33). From this verse, it is explicitly mentioned the offences and the nature of punishment. Muslim scholars categorized the punishment based on the gravity and grade. They enumerated the types of punishment mentioned in the verse as, killing, crucifying, cutting of hand and feet, and expel from the country. They therefore attributed killing to kidnapping operation that contains killing of people unjustly, crucifying is attached to operation the involves killing, creating fear in the mind of people and stealing, cutting off the hand and feet in opposite sides is aligned with operation that involves stealing while banishment is for breaking the peace of the community. The operation of kidnappers normally goes along with all afore mentioned categories of unscrupulous activities mentioned in the Quran therefore punishment should be pronounced base on Judiciary Decision in the country.

Islamic Perspectives on Peace Building

Building peace and spreading it among the people is a fundamental responsibility of all Muslims as it is appeared in the meaning of Islam (*salam*) which means peace. This implies that Muslims are expected to build peace, give safety and construct security wherever they find themselves. In many portions of Hadith Prophet Muhammad (PBUH) was reported to have encouraged building peace and discouraged distorting it. Among the Hadith where Prophet encouraged peace building are: *“He who grants safety to a fearful person, Allah will grant him safety from the torment of the Day of Judgment” (Musnad Ahmad 12657).* This Hadith is pointing to the

significance of restoring peace and security to any community that is not safe. Building peace is a sign of true believer, on this note Prophet Muhammad (PBUH) was reported to have said: *“The Muslim is the one from whose tongue and hand the Muslims are safe, and the believer is the one whom people trust with their lives and wealth” (Sahih Al-Bukhari, 10; Sahih Muslim, 40).*

In showing sacredness of peace building, Prophet Muhammad (PBUH) was reported to have said: *“your blood, your wealth, and your honour are sacred to one another, as sacred as this Day of yours, in the month of yours, in the city of yours...” (Sahih al-Bukhari, 1739; Sahih Muslim, 1679).* It is understood from this Hadith that secure other peoples’ lives, wealth and properties is a compulsory assignment on every righteous Muslim and he/she should not tamper with others’ peace, safety and security.

Community Policing for Curbing Kidnapping

Community is a place where people living together to promote peace, safety and security among themselves. In Islam community is seen as an abode where people of different culture, religion, race and tribe live together as brothers and sisters. The typical example of this is the community established by Prophet Muhammad in Madinah which is based on pure faith and strong brotherhood. On this note Prophet Muhammad (PBUH) was reported to have said: *“The Muslim is the brother of the Muslim; he does not wrong him nor abandons him” (Sahih al-Bukhari 2442; Sahih Muslim, 2580).* The meaning of this Hadith is that Muslim community needs to promote real brotherhood in justice, cooperation, support, and protection. This is also confirmed from Quran where Allah says: *“You are the best community that ever emerged for humanity: you advocate what is moral and forbid what is immoral, and believe in Allah ...” (3:110).* This verse is describing the characteristics of Muslim community, how does it look like and what the people therein value much. According to the verse, Muslim community is the best community because of high level of cooperation, love, support, and compassion and all this will result to total safety, love and peace in the community.

Policing is the process of developing innovative and comprehensive approach to the maintenance of community in order to protect or prevent the people from internal or external attack like kidnapping, killing, and bombing (Abati, 2010). Community policing is a new innovation in the history of Nigeria security defense established to strengthen the enforcement of laws and

operation of Security Defense in the country. Prophet Muhammad (PBUH) had encouraged such in Madinah as part of implementing Allah's rule of security. This is evident in the Quran where Allah says: *"And beware of discord which does not afflict the wrongdoers among you exclusively, and know that Allah is severe in retribution"* (8:25). This verse is a strong warning from Allah against fearing not to defend the community and Allah let them know that repercussion of that will not affect only the weak. In another verse, Allah says: *"So fight in the cause of Allah, you are responsible only for yourself. And rouse the believers. Perhaps Allah will restrain the might of those who disbelieve. Allah is Stronger in Might, More Punishing"* (4:84). The verse is making waging war against the terrorist like kidnappers, militants and others compulsory on community heads that need to strategise for effective means to curb kidnapping activities within the community.

From foregoing, it is now understood that community policing is an alternative defensive strategy designed to reduce corruption in the community but managed by the members of such community in collaboration with Security Agency in the state. According to Bureau of Justice Assistance (2013), community policing is a security operation that involves the active participation of local government, civic and business leaders, public and private agencies, residents, Mosques, Churches, schools and hospitals in carrying out collective exercise to ameliorate the perpetrators of evils in any given community. In the same vein, Acha, et al. (2023) explained that establishing community policing needs all forms of collaborative efforts and plans to exploit the power of crimes promoters in the community and it requires substantive planning like identification of kidnappers' channels, methods used in getting communication and their hidden abodes. On this note Allah says: *"Those who perpetrated the slander are a band of you..."* (24:11). This is a confirmation from the Quran that kidnappers who are threatening peoples in Kwara State are getting information from a group of people who are part and parcel of those communities. And with the application of effective community policing wrong members will be identified and dealt with accordingly.

Soluade, et al. (2025) worked on community based security and curbing of kidnapping in Oke-Ogun Oyo State, Nigeria. The study reported that the primary factors that contributed to the increase of kidnapping operation in the state are among others weak law enforcement, insufficient security, unemployment and poverty. In Acha, et al. (2023), it is stated that community

participation, collaboration between community policing and law enforcement agency and establishment of quasi-judicial security outfits will reduce kidnapping operation in any given community in the country. Ochiagha et al. (2023) suggested that recruitment of more vigilantes and training of community members how to track and suspect crime promoters in the community will ameliorate the operation of kidnappers in the community. Therefore, collaborative efforts of all members of the community with sincerity and honesty are among the vital solutions to the threat and trauma of kidnapping in the state. Akeem and Shitu (2025) reported that community policing has been effectively adopted in many countries in the world to curb crimes and atrocities in the society but Nigeria is facing increase in crimes like kidnapping, militancy, and insurgency due to factors including religious and political influences, corruption, lack of trust in law enforcement, inadequate funding, and polluted socio-cultural practices.

Conclusion

Islamic perspectives in using community policing to reduce the operation of kidnappers in Kwara State was systematically discussed in this study and therefore injunctions from al-Quran and Hadith were adopted to justify the position and contributions of Islam to the curbing strategy against crimes and the perpetrators like kidnappers, militant, insurgent and others. The study mentioned the significant contributions of community members in ameliorating the operation in the state and what previous researchers had mentioned regarding planning to succeed like community participation, collaboration between community policing and law enforcement agency, establishment of quasi-judicial security outfits, recruitment of more vigilantes and training of community members how to track and suspect crime promoters in the community among others.

Suggestions

Based on the findings of the study, the following were the suggestions raised: that

1. Kwara State Security Agency should intensify their efforts by providing effective and standby security officers that will be monitoring affected local government areas in the state.

2. Community leaders in collaboration with state security agency should establish local armed vigilantes that will be working day and night with in the community and its environ.
3. Members of the community should be trained on how to spy sincerely and honestly in order to fish out the informants and bad heads among the members.
4. Religious leaders should be encouraged to pray for peace and preach peace building in the community. This will allow members to understand the importance of having peace in the community.

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Effectiveness of Think-Pair-Share Learning Strategy on Achievement and Retention in Electrolysis among Secondary School Chemistry Students in Dutsin-Ma, Nigeria

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Abstract

This study examined the impact of the Think-Pair-Share (TPS) cooperative learning strategy on students' academic achievement and retention in the electrolysis concept of chemistry among SSII students in Dutsin-Ma Educational Zone, Katsina State, Nigeria. Using a quasi-experimental design, 130 students were randomly assigned into experimental (TPS) and control (lecture method) groups. A validated 30-item Electrolysis Achievement Test (EAT) was administered as pre-test, post-test, and retention test. Data analyzed via ANCOVA revealed that students taught using TPS significantly outperformed those taught with the conventional method in both achievement and retention. Gender had no significant effect on outcomes. The findings recommend adopting TPS for improving understanding and long-term recall of difficult chemistry topics.

Keywords: Think-Pair-Shares, Achievements, Electrolysis, Learning Strategy, Dutsinma Zonal Quality Assurance Office

Introduction

Chemistry is a foundational science subject in Nigeria's secondary education system that is essential due to the fact that chemistry which involves the study of matter, its applications, and reactions, is a subject that is significant in both our daily lives and the growth of nations. This supports the claim made by Ezeudu et al. (2019) that chemistry provides the majority of a nation's labour force. As a result, chemistry aids in human comprehension of common materials and processes. Onyi & Nwafor (2022) and Ezeudu et al. (2019) provided empirical evidence for the low and fluctuating achievement of students in chemistry. This is supported by the Chief Examiners Reports (2017–2021) of the West African Examination Council (WAEC), which show

a pattern of inconsistency and a pressing need for improvement in students' achievement in the subject.

Low students' achievement in Chemistry has largely been linked to the employment of traditional teaching methods (lecture method) rather than student-centered learning strategies (Odukwe & Nwafor, 2022). Despite the fact that the conventional teaching approach (lecture method) ensures that students' course material is quickly covered, it also encourages rote learning and turns students into passive learners by preventing them from actively engaging in the learning process. Their success will unavoidably be impacted by this. Chemistry is a science topic that emphasizes hands-on learning and encourages student participation. Therefore, in order to improve student achievement, chemistry teachers must adopt activity-based instructional strategies like the think -pair-share (TPS), which encourages interaction between the students and the course materials.

Think -pair-share (TPS) is a method whereby students cooperate in groups to solve academic difficulties and attain their learning objectives. According to Nokes-Malach & Richey (2015), a TPS instructional strategy is one where students participate in small group activities to share their knowledge and experience. TPS instruction, according to Ali et al. (2021), "is an instructional strategy in which teachers work together on specific subject". Therefore, in the TPS strategy, the teacher helps to address a specific problem in order to facilitate the day-to-day instructions. This method encourages students to actively participate in their learning experience and acquire the knowledge required to address societal issues. The teacher acts as a facilitator in TPS learning and directs the students' learning activities. Group work, a component of a TPS educational technique, is acknowledged by Liu et al. (2018) as improving student performance, confidence, autonomy in learning, and good feelings while lowering anxiety.

Additionally, a TPS instructional strategy improves students' academic and social skills (Sears & Reagin, 2013), fosters student satisfaction, improves learning outcomes, and develops critical thinking (Mosley et al., 2016), improves students' learning (Fatimah et al., 2020), and supports the development of learners' positive attitudes as well as their confidence and public speaking skills (Ha et al., 2022). From the foregoing, studies show lack of literature on the effect of think-pair-share instructional strategy on students' achievement in Chemistry in Nigeria and as observed by Johnson et al. (2007),

the learning potential by think-pair-share is underutilized in practice, particularly in science education, therefore Chemistry, like other science subjects, requires the adoption of a think-pair-share instructional strategy to attain a specified learning result, hence, the gap of the study. Furthermore, the study considered the influence of gender on the achievement of students in Chemistry when taught using TPS instruction strategy. This is necessitated due to some contradictory evidences (Onyi & Nwafor, 2022; Ezeudu et al., 2019; Aniodoh & Egbo, 2013) and lack of clear trend on the influence of gender on students' achievement in Chemistry.

Hence, the main purpose of the study was to determine the effect of TPS instruction on secondary school students' achievement in chemistry. Specifically, the study determine the effect of think-pair-share instructional strategy on the achievement of secondary school students on electrolysis, find out the effect of think-pair-share instructional strategy on student's retention of electrolysis, determine the differences in achievement level between male and female students in electrolysis when taught using think-pair-share instructional strategy and to ascertain the differences in retention level of male and female students in electrolysis concepts when taught using think-pair-share strategy. In this study, the researcher investigated the effects of think-pair-share instructional strategy on secondary school students' achievement and retention in electrolysis in Dutsin-Ma education zone only.

Research Questions

The study provided answers to the following research questions:

1. What is the difference in the mean academic performance scores of students taught electrolysis using think-pair-share strategy and those taught using conventional teaching method?
2. What is the difference between the mean retention scores of students taught electrolysis using think-pair-share strategy and those students taught using conventional method?
3. What is the difference between the mean academic performance scores of male and female students taught electrolysis using think-pair-share strategy?

4. What is the difference between the retention mean scores of male and female students in electrolysis when taught using think-pair-share strategy?

Hypotheses

The following null hypotheses were formulated to guide this study and were tested at 0.05 level of significance.

1. There is no significant difference in the mean academic achievement scores of students taught electrolysis using think-pair-share strategy and those taught using conventional method.
2. There is no significant difference in the mean retention scores of students taught electrolysis using think-pair-share strategy and those taught using conventional method.
3. There is no significant difference in the mean achievement scores of male and female students taught electrolysis using think-pair-share strategy.
4. There is no significant difference in the mean retention scores of male and female students taught electrolysis using think-pair-share strategy

Methodology

The study adopted a quasi-experimental design involving pre-test, post-test and post-posttest (retention test). The population of the study comprised 781 SS II chemistry students in public co-educational senior secondary schools in Dutsin-Ma Education Zone which consists of 437 males and 344 females with an average age of 16 to 17 years. According to Zonal Education Quality Assurance unit there are twelve (12) co-educational public secondary schools in Dutsin-Ma Education Zone that are offering chemistry **and** total number of 130 SS II chemistry students are drawn from two public senior secondary schools in Dutsin-Ma Zonal Education Quality Assurance formed the sample of the study Two (2) Co-educational schools were selected using simple random sampling techniques (ballot boxing). Out of the twelve (12) public Co-educational schools in Dutsin-Ma Education Zone for good representation and to avoid biasness that may arise from single sex schools. These schools are Government Pilot Senior Secondary School, Dutsin-Ma and Government Day

Senior Secondary School Karofi. Government Pilot Senior Secondary School Dutsin-Ma was selected randomly as the control group while Government Day Senior Secondary School, Karofi was selected to be the experimental group and one intact class in each of the sampled school was selected using the simple random sampling from the SS II arm of each school for the study.

Results

Research Question One: What is the difference in the mean achievement scores of students taught electrolysis using think-pair-share strategy and those taught using conventional teaching method?

Table 1: Descriptive Statistics of the Post-test Means Scores and Standard Deviations of Both Experimental and Control Groups

Groups	N	Mean	SD	Std. Error Mean	Mean Difference
Experimental	60	45.87	7.860	1.015	13.43
Control	70	32.44	9.615	1.149	

In Table 1 the post-test scores mean and standard deviation of the experimental group are 45.87 and 7.860 while those of control group are 32.44 and 9.615 respectively. The mean difference between the two groups is 13.43. This implies that the students in the experimental group achieve more.

H01: There is no significant difference in the mean achievement scores of students taught electrolysis using think-pair-share strategy and those taught using conventional teaching method.

Research Question Two: What is the difference between the mean retention scores of students taught electrolysis using think-pair-share strategy and those students taught using conventional method?

Table 2: Descriptive Statistics of the Post Post-test Means Scores and Standard Deviations of Both Experimental and Control Groups

Groups	N	Mean	SD	Std. Error Mean	Mean Difference
Experimental	60	45.87	7.860	1.015	13.43
Control	70	32.44	9.615	1.149	

Table 2 displays that, the post post-test scores mean and standard deviation of the experimental group are 45.87 and 7.860 respectively while those of control

group are 32.44 and 9.615. The mean difference between the two groups is 13.43. Thus, the experimental group retain higher than the control group.

Research Question Three: What is the difference between the mean achievement scores of male and female students taught electrolysis using think-pair-share strategy?

Table 3: Descriptive Statistics of the Post-Test Means Scores and Standard Deviation of Male and Female Students in the Experimental Group

Gender	N	Mean	SD	Std. Error Mean	Mean Difference
Male	40	46.13	7.640	1.208	
Female	20	47.25	8.602	1.923	-1.12

Table 3 revealed that the post-test means scores and standard deviation of male students in the experimental group as 46.13 and 7.640 while post-test score and standard deviation of the female students was 47.25 and 8.602 with mean difference of -1.12. From the mean scores, female student slightly achieves higher than the male counterpart when exposed to the treatment.

Research Question Four: What is the difference between the retention mean scores of male and female students in electrolysis when taught using think-pair-share strategy?

Table 4: Descriptive Statistics of Post Post-Test Means Scores and Standard Deviation of Male and Female Students in the Experimental Group Exposed to TPS

Gender	N	Mean	SD	Std. Error Mean	Mean Difference
Male	40	41.00	7.736	1.223	
Female	20	40.05	9.162	2.049	0.95

Table 4: revealed that, the post post-test scores, mean and standard deviation of male students in the experimental group is 41.00 and 7.736 and those of the female students are 40.05 and 9.162, their mean difference is 0.95. Hence from the mean scores, the males retained higher than the female after posttest.

Hypotheses Testing

For the inferential analysis, ANCOVA was used to test the null hypotheses at 0.05 level of significance.

H₀₁: There is no significant difference in the mean achievement scores of students taught electrolysis using think-pair-share strategy and those taught using conventional teaching method.

To test null hypothesis one, the achievement scores of students in experimental and control groups were subjected to ANCOVA and summary of analysis is presented in Table 4.7.

Table 5: ANCOVA analysis of post-test scores of experimental group and control groups

Source	Type III sum of squares	Df	mean square	F	Sig.	Rm
Corrected model	5821.803 ^a	1	5821.803	74.339	.000	S
Intercept	43425.042	1	43425.042	554.498	.000	S
GROUP 2	5821.803	1	5821.803	74.339	.000	S
Error	10024.205	128	78.314			
Total	209927.000	130				
Corrected total	15846.008	129				

R Squared = .367 (Adjusted R Squared = .362)

Table 5 indicated that, there is significant difference in the mean achievement scores of students taught electrolysis using think-pair-share and their counterparts taught using Conventional Method. [$F = 74.33$, $p = 0.000$ and Adjusted R Squared = .362 hence $p < 0.05$] and therefore the null hypothesis is rejected. The p- value obtained was 0.00, at 0.05 level of significance with degree of freedom of 130. Hence, the null hypothesis was rejected. This means that there is significance different in the mean scores of experimental group taught electrolysis concept using think-pair-share as an Instructional Strategy. Compare with those taught using conventional method. 08034607865 Eng Ka

Ho2: There is no significant difference in the mean retention scores of students taught Electrolysis using think-pair-share strategy and those taught using conventional method.

Table 6: ANCOVA analysis of post-post test scores of experimental group and control group

Source	Type III sum of squares	Df	mean square	F	Sig.	R
Corrected model	1441.030 ^a	1	1441.030	20.478	.000	S
Intercept	27437.145	1	27437.145	389.906	.000	S
GROUP 4	1441.030	1	1441.030	20.478	.000	S
Error	9007.193	128	70.369			
Total	187015.000	130	1441.030			
Corrected total	10448.223	129				

R Squared = .138 (Adjusted R Squared = .131)

Table 6 indicated that, there is significant difference in the mean achievement scores of students taught electrolysis using think-pair-share and their counterparts taught using Conventional Method. [$F = 20.47$, $p = 0.000$ and Adjusted R Squared = .131 hence $p < 0.05$] and therefore the null hypothesis is rejected. The p- value obtained was 0.00, at 0.05 level of significance with

degree of freedom of 130. Hence, the null hypothesis was rejected. This means that there is significance different in the mean scores of experimental groups taught electrolysis concept using think-pair-share as an Instructional Strategy.

H₀₃: There is no significant difference in the mean achievement scores of male and female students taught electrolysis using think-pair-share strategy.

Table 7: ANCOVA analysis of males and females' chemistry students in the experimental group

Source	Type III sum of squares	Df	mean square	F	Sig.	R
Corrected model	202.073 ^a	1	202.073	3.352	.072 NS	
Intercept	4463.085	1	4463.085	74.025	.000 S	
Gender Pre	202.073	1	202.073	3.352	.072 NS	
Error	3496.927	58	60.292			
Total	133434.000	60	202.073			
Corrected total	3699.000	59				

Table 7 revealed that there is no significance difference in the mean achievement scores of male and female students taught electrolysis using think-pair-share strategy. Considering the result of this test, the hypothesis is not rejected. The p-value obtained was 0.72, while the F-value is 3.35 at 0.05 level of significance with Adjusted R Squared = .038. Hence, the null hypothesis is not rejected. Since the p-value is greater than 0.05 level of significance, the null hypothesis which states that there is no significant difference in the mean achievement scores of male and female students taught electrolysis using think-pair-share strategy is thereby upheld.

H₀₄: There is no significant difference in the mean retention scores between male and female students exposed to think-pair-share (TPS).

Table 8: ANCOVA analysis Test of post posttest scores of male and female students of the experimental groups

Source	Type III sum of squares	Df	mean square	F	Sig.	R
Corrected model	169.241 ^a	1	169.241	2.603	.112 NS	
Intercept	3351.468	1	3351.468	51.537	.000 S	
Gender Pre	169.241	1	169.241	2.603	.112 NS	
Error	3771.743	58	65.030			
Total	103249.000	60	169.241			
Corrected total	3940.983	59				

. R Squared = .043 (Adjusted R Squared = .026)

Table 8 revealed that the p-value obtained was 0.11, while the f-value is 2.603 at 0.05 level of significance. Since the p-value of 0.11 is less than 0.05 level of significance, the null hypothesis was rejected which means there is a

significant difference in the mean retention scores of male and female students taught electrolysis using TPS strategy.

Discussion

The finding of research question one and hypothesis one revealed that chemistry students taught using think-pair-share instructional strategy had high mean academic achievement scores than those taught using conventional lecture method. This implies that the use of TPS strategy in teaching electrolysis concepts enhances students' academic achievement in the subject. The reasons for the good achievement of the experimental group when comparing the general academic achievement of experimental group and control group is that the students in experimental group were stimulated to learn by seeing themselves in a group and also feel free to communicate and find the solution to their problems themselves and this prompted more attention by the students.

The findings of research question two and hypothesis two and four revealed that students taught using TPS strategy gained retention more than the control group taught using conventional lecture method. The findings of this study corroborated the earlier findings of; Carss (2007), who earlier suggested that think-pair-share could sustain students' retention in science, Technology and Mathematics (STM), it was also found out that TPS group significantly retained higher than the lecture methods group. Therefore, the research hypothesis was rejected. The two teaching strategies are significantly different in their effects on students' retention in chemistry. This implies that TPS strategy is more effective in retention than lecture method.

The last finding of this study revealed that there is significant difference in the mean retention ability scores of male and female students in electrolysis concepts when taught using TPS. Hence from the mean scores, the males retained higher than the female after posttest. think-pair-share likely improved students' performance and retention ability for several reasons:

1. Active Engagement: Think-pair-share encourages active participation and engagement, allowing students to discuss and think critically about the material, which enhances understanding and retention.

2. **Peer Learning:** Students benefit from explaining concepts to each other, reinforcing their own understanding and helping peers clarify doubts.
3. **Collaborative Environment:** The strategy fosters a sense of community and cooperation, reducing anxiety and making learning more enjoyable, which can lead to better academic outcomes.
4. **Immediate Feedback:** Students receive immediate feedback from peers, allowing them to adjust their understanding and correct misconceptions in real-time. These factors combined may explain why think-pair-share outperformed conventional lecture methods in improving both achievement and retention among students in electrolysis concepts.

Conclusion

The following conclusion were drawn based on the findings of this study:

1. TPS learning strategy has positive effect on students achievement and performance in electrolysis improves secondary school students' achievement in learning Electrolysis.
2. TPS learning strategy enhances the performance of both male and female students in learning Electrolysis Concepts; this is evident in the second finding of this study which indicates that there is no significant difference in the mean achievement of male and female students in Electrolysis concept when taught using TPS.
3. TPS learning strategy also improves students' retention ability in learning Electrolysis concepts when taught using it as method of instruction.
4. TPS learning strategy is not gender friendly with regards to the retention ability of the students, just as the result discloses that there is a significant difference in the mean retention scores of male and female students in Electrolysis concepts when TPS is used to teach.

Recommendations

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

1. Secondary schools Chemistry teachers should expose their students to TPS instructional strategy, in order to improve the students' achievement and retention.
2. For better achievement in chemistry, chemistry teachers should incorporate use of TPS strategies to complement their traditional teaching-learning approach which was found ineffective in enhancing students' achievement and retention.
3. Government and stakeholders in Education should encourage chemistry teachers by creating enabling instrument to incorporate TPS in teaching chemistry, as a means to improve both male and female students' achievement and retention in learning chemistry.
4. Professional bodies and educational agencies like STAN, TRCN, VESA, and NERDC should collaborate to organize workshops, seminars, and conferences for training science teachers on think-pair-share skills, develop subject-specific models, and facilitate training for teacher trainees.

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Relationship Between Incentive, Recognition and Teacher Job Performance in Senior Secondary Schools in Sokoto State, Nigeria

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Abstract

This study examined the relationships between incentive, recognition and teacher job performance in senior secondary schools in Sokoto State. Correlational survey research design was employed in the study. The study population consists of 3457 teachers and 18247 SS2 students across 132 senior secondary schools in Sokoto State. A Stratified and proportionate sampling technique were used to select 24, senior secondary schools, 346 teachers and 378 SS2 students across six education zones in Sokoto State. Three validated researcher-developed instruments; (i) Incentive Rating Scale (IRS) (ii) Recognitions Rating Scale (RRS) (iii) Teacher Job Performance Rating Scale (TJPRS) were used for data collection. Test- retest method was used in establishing reliability of the instruments. The two tests were computed and run through Person Product Moment Correlation coefficient (PPMCC). The reliability indexes of 0.89, 0.74 and 0.85 were established for IRS, RRS and TJPS respectively. Data collected were analysed using Person Product Moment Correlation statistics. Finding revealed statistically significant relationship between incentives, recognition and teacher job performance in senior secondary schools (incentive $r=.87$ and recognition $r=.78$). Part of the recommendations stated that Government and School authorities should strengthen financial and non-financial reward systems that encourage teachers to stay committed to their job performance in senior secondary schools in Sokoto State.

Keywords: Incentives, Recognitions and Teacher Job performance

Introduction

Education is an instrument for sustaining the students' performance, an instrument of stability, sound in mind, body of knowledge and skill that will enable students to live a useful life and having a standard of conduct to be trusted as well as being a man of peace, courage and sound judgements (Oluyemi, 2020). Therefore, the students achieve the above-mentioned values and qualities, such a student need to be taught and trained by the teachers. A teacher is someone who has been exposed the student to a good measure of training in a teaching subject area as well as various profession in educational systems (Sani, Uwaleke, & Chuks, 2023). The success and failure of educational activities at any level depends on the job performance of teachers (Isa & Hadijaya, 2024). Therefore, the performance of teachers is forceful for the sustaining of student performance at different field of education. Teachers are equally regarded as the most important element of the school system, more over the important the quality of equipment, materials and the level of financing teacher in educational systems(Sani et al., 2023).

Moreover, in teaching and learning process, teachers have to be encouraged in order to boost their productivity, effectiveness, efficiency and dedication in performing their professional duties, undoubtedly, enhance quality assurance, quality education and quality instructional delivery (Precious & Lucky, 2020). Building on this, the study aims to examine the relationship between incentives, recognition, and teacher job performance. Motivational theories such as reinforcement, equity, and self-determination explain how incentives and recognition enhance individual motivation and job performance (Malebe, Nyabisi, & Ochieng, 2023). Motivation in schools is multidimensional, as teachers are influenced by factors like incentives, recognition, job security, and professional development.

Teacher motivation relates to a purposive and goal-directed conduct, job performance and attitudes towards professional responsibilities. Teacher incentives are essential for attracting, retaining, and motivating educators. Traditionally framed as salaries or performance-based pay, incentives now encompass both financial and non-financial benefits. Financial incentives include timely salary payment, cash rewards, and allowances for extra responsibilities, while non-financial incentives cover recognition, housing, meals, gifts, training opportunities, and other welfare support. Together, these provisions improve teachers' well-being, foster commitment, and enhance job performance, ultimately leading to better student learning outcomes (Makruf et al., 2020; Oluyemi, 2020; Henry, 2024). Financial incentives can directly influence teachers' motivation by reinforcing their efforts toward achieving educational goals (Karoga & Hassan, 2020).

It is contended that if these needs are met in the educational institutions by granting teachers' needs like fringe benefits, promotion, retirement or pension schemes, insurance benefits, welfare benefits, free medical and health services, job security and safe working conditions the extent of teachers' job performance will definitely be intensified (Precious & Lucky, 2020). Furthermore when teachers know that their hard work can lead to tangible rewards, they may be more motivated to go above and beyond in their teaching practices (Makruf et al., 2020). Incentives shape teachers' attitudes, improving commitment, punctuality, and student supervision, and also promote teacher involvement in school management and discipline (Henry, 2024). The overall, both forms of incentives strongly enhance teacher motivation, teacher job performance, and student learning improvement, especially in secondary schools.

Teacher incentives significantly boost their performance schools, as a study conducted in Ogun State, Nigeria, has shown. Researchers used a survey to gather data from teachers in both private and public schools. The findings confirmed a strong positive link between incentives and job performance, underscoring the vital role of these benefits in motivating teachers. Based on these results, it's recommended that the government enhance teachers' welfare packages, working conditions, and other benefits to improve their overall performance (Oluyemi 2020). Furthermore, another study conducted, assessed the Influence of Incentives on Teachers' Performance in Public Secondary Schools in Longido District. Descriptive survey design, mixed methods

approach were adopted and data was analyzed using descriptive statistics. The study revealed that job promotion, housing facilities, traveling allowances, improved working environment, vacation/study leave and maternity leave are incentives offered to teacher in secondary schools. Some part of recommendation stated that school heads and stakeholders in education should initiate income generating activities in schools and community support to school management in order to create a reliable source for teachers' motivation (Mtesigwa & Otieno, 2022).

Recognition programs can nurture a culture of appreciation within organisation, where employees are celebrated for their contributions in the organisations, leading to increased morale and enhanced job performance (Karwai, Malachy, Bashir & Nwidi, 2022). Teacher recognitions by the school administrators, school base management committee (SBMC), parent teacher association (PTA) and students significantly contribute to teachers' morale and commitment to their job performance in schools (Karwai et al., 2022). When teachers receive acknowledgment for their efforts and successes, it fosters a positive professional climate that encourages them to strive for excellence performance, and feel valued. Literature bound that teachers are more likely to create dynamic, engaging learning environments that benefit students in secondary schools (Odhiambo, Murira, & Ogeno, 2023).

Recognition of teachers is vital in enhancing their effectiveness. It can take different forms, including verbal appreciation, tangible rewards, and constructive feedback, offered either privately or publicly. Such acknowledgment helps teachers feel respected and valued, which in turn motivates them and boosts their overall performance (Chukwuemeka Sarah, & Chukwumobi, 2021). Improved teacher performance is directly linked to better student learning outcomes, which ultimately impacts the broader educational background in Nigeria (Khaemba, Maiyo & Manini 2024). Today, teachers value not only financial rewards but also acknowledgment of their efforts. Acts of recognition, such as praise, certificates, awards, or public appreciation, function as simple yet highly effective motivators (Karwai et al., 2022; Karoga & Hassan, 2020). When schools acknowledged teachers' contributions, it strengthens morale, increases job satisfaction, and encourages desirable behaviors. As a non-monetary incentive, recognition promotes dedication, inspires excellence, and enhances overall job performance, contributing to a supportive and productive school environment (Ijaguwa, 2020).

Khaemba, Maiyo, and Manini (2024) examined the relationship between employee recognition practices and teacher performance. Descriptive survey design, mixed methods approach were adopted and data was analyzed using descriptive statistics and inferential statistics. The study found that there is a lack of a clear, systematic and comprehensive implementation approach to employee recognition in most schools and it is clear that recognition and rewards are critical factors towards the establishment of a quality culture that appreciates and values the contribution of teachers and their accomplishments in service delivery. The study found that there is a positive significant relationship between employee recognition and teacher performance. The study concluded that an improvement in employee recognition is likely to result in a corresponding improvement in teacher performance. T (Khaemba et al., 2024).

In relation to teacher job performance, Teachers in Sokoto State received inadequate salaries, lack of staff development programme and poor teacher recognitions which undermines their motivation to engage effectively in the teaching and learning activities in secondary schools in Sokoto State (Hussaini et al., 2023; Karoga & Hassan, 2020) Therefore, low salaries of secondary school teacher fail to cover basic monthly expenses such as food, clothing, and other necessities, which prompt teachers to seek additional employment opportunities, such as, motorcycle taxi services or part-time jobs and others business to support themselves and their families (Karoga & Hassan 2020; Amaefule & Ossai, 2023). Subsequently, these created a poor performance of teachers. includes lack punctuality, irregular assessment and evaluation of students, unfulfilled the curriculum and weekly dairy, poor classroom management and lack teacher's participation in sports in senior secondary school in Sokoto State. Therefore, this study aims to examined relationships between incentives, recognition and teacher job performance in senior secondary schools in Sokoto State, thereby filling the research gap identified.

Statement of the Problems

The performance of teachers is critical in the implementation of the curriculum and in enhancing the quality of education in senior secondary schools in Sokoto State. However, Inadequate pay, delayed salaries, a lack of recognition, and poor promotion prospects have created a cycle of demotivation that severely impacts the performance of teachers in Sokoto State's secondary schools (Hussaini et al., 2023; Karoga & Hassan, 2020)

Financial distress from poor and inconsistent pay prevents teachers from focusing on their professional duties, leading to disengagement and absenteeism. This is worsened by a lack of public acknowledgement and professional recognition, which erodes their intrinsic motivation and pride in their job performance in schools.

Today, teachers value not only financial rewards but also acknowledgment of their efforts. Acts of recognition, such as praise, certificates, awards, or public appreciation, function as simple yet highly effective motivators (Karwai et al., 2022; Karoga & Hassan, 2020). Furthermore, providing incentive and recognition will enhance overall job performance, contributing to a supportive and productive school environment. In line with these, various problems affected teacher job performance, in secondary school in Sokoto State. There is need for various motivation factors to address teacher needs and propel their performance to the maximum level in the process of teaching and learning throughout the senior secondary schools in Sokoto State. This phenomenon prompted the researchers to conduct a study to examine the relationship between incentives, recognition and teachers' job performance in senior secondary schools in Sokoto State, Nigeria.

Objectives of the Study

The purpose of this study is to examine relationship between incentive, recognitions and teacher job performance in senior secondary schools in Sokoto State. Specific objectives are to find out:

1. The extent of relationship between incentive and teacher job performance in senior secondary schools in Sokoto State.
2. The extent of relationship between recognition and teacher job performance in senior secondary schools in Sokoto State.

Research Questions

The following questions were raised to guide the study:

1. What is the extent of relationship between incentive and teacher job performance in senior secondary schools in Sokoto State.
2. What is the extent of relationship between recognition and teacher job performance in senior secondary schools in Sokoto State.

Research Hypotheses

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

1. There is no significant relationship between incentive and teacher job performance in senior secondary schools in Sokoto State.
2. There is no significant relationship between recognition and teacher job performance in senior secondary schools in Sokoto State.

Methodology

Descriptive survey of Correlational design was employed in the study. The study population consists of 3457 teachers and 18247 SS2 students across 132 senior secondary schools in Sokoto State. A Stratified and proportionate sampling technique were used to select 24, senior secondary schools, 346 teachers and 378 SS3 students across six education zones in Sokoto State. Three validated researcher-developed instruments; (i) Incentives Rating Scale (IRS), (ii) Recognition Rating Scale (RRS) (iii) Teacher Job Performance Rating Scale (TJPRS) were used for data collection. Test- retest method was used in establishing reliability of the instruments. The two tests were computed and run through Person Product Moment Correlation coefficient (PPMCC). The reliability indexes of 0.89 0.74 and 0.85 were established for IRS, RRS and TJPS respectively. Data collected were analysed using Mean, standard deviation and Person Product Moment Correlation statistics.

Results

The hypotheses were tested using Pearson Product Moment Correlation (PPMC) with the basic assumption such as linearity, normality, homoscedasticity, independence and scale of measurement, were been taking into consideration for the analysis to ascertain the relationship between two variables at a .05 level of significance.

H0₂: There is no significant relationship between incentive and teachers job performance in senior secondary school in Sokoto State.

Table 1: Relationship between Incentive and Teacher's Job Performance

Variables	N	Mean	S. Deviation	r-Cal	p-Value	Decision
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2. There is strong, positive and significant relationship between recognition and teacher's job performance in senior secondary school in Sokoto State.

Discussion

The finding, found a strong and statistically significant positive relationship between incentive and teacher job performance in senior secondary school in Sokoto State. This indicates that teachers who receive adequate incentives, such as financial benefit e.g extra-allowance salaries, bonuses, and non-financial benefits e.g transport palliative and medical grand are more motivated and committed to their job performance in schools. The finding aligns with Oluyemi (2020) that there positive and significant relationship between teachers' incentive and teachers' performance in primary school. Teacher incentives serve as a powerful motivator in enhancing job performance by fostering job satisfaction and reducing workplace stress. The finding is inconsistent with Karoga and Hassan, (2020) that non-monetary incentive had greater contribution than monetary incentive on teachers' performance. The finding is inline with of Mtesigwa and Otieno, (2022) found that job promotion, housing facilities, traveling allowances, improved working environment, vacation/study leave and maternity leave are incentives offered to teacher in secondary schools. The strong correlation found in this finding indicates the availability structured incentive programs, such as performance-based bonuses, and housing allowances, were implemented. Furthermore enhance teachers' job performance, promote teacher behaviour and improve the overall quality of education in senior secondary school in Sokoto State.

The finding, found a strong positive and significant relationship between recognition and Teacher's Job Performance in Senior Secondary School in Sokoto State. This suggests that when teacher receive adequate recognition for their efforts, they are more likely to be motivated, committed, and effective in their teaching roles. Recognition, whether through verbal appreciation, awards, promotions, or professional acknowledgments, serves as a powerful tool in enhancing job satisfaction and encouraging teachers to put in their best efforts. The finding aligns with the work of Khaemba, Maiyo and Manini (2024) submission, that there is a strong, positive and significant relationship between employee recognition and teacher Performance. Recognition is essential in sustaining teachers' morale and motivation, ultimately leading to

improved teaching quality and student outcomes. Similarly, the study supports Karwai, Malachy, Bashir, and Nwidi (2022) submission that teacher recognitions have positive and significant influence on teacher contribution. The teacher recognitions play a significant role in increasing teachers' job performance by reinforcing positive behaviors and work ethics. Conversely, a lack of recognition can lead to job dissatisfaction, reduced motivation, and even high turnover rates. The study established a strong, positive correlation between recognition and job performance, in senior secondary school in Sokoto State. Furthermore, enhances teachers' motivation, lead to improved their job performance, and promote effective education system in the Sokoto State.

Conclusion

The finding shows strong, positive, and significant relationship between incentives and teacher job performance This indicates that teachers receive adequate incentives, such as financial benefit e.g extra-allowance, bonuses, and non-financial benefits e.g transport palliative and medical grand that motivated and committed to their job performance in schools. The finding shows Strong positive and significant relationship between recognition and teacher job performance. Teacher recognition, through verbal appreciation, awards, promotions, or professional acknowledgments, serves as a powerful tool in enhancing teacher job performance. Conclusively from findings of the study found that incentive, recognitions have strong positive and statistical significant relationship with teacher job performance in senior secondary school in Sokoto State, Nigeria. These findings underscore the importance of maintaining and improve the identified determinant of incentives and recognitions to ensure sustained high performance among teachers.

Recommendations

The findings of the study and conclusion presented the following recommendations. To ensure sustained high performance among senior secondary school teachers in Sokoto State, Nigeria, it is crucial for educational administrators and policymakers to focus on two key areas: incentives and recognition. Given that incentives strongly motivate teachers, schools should

not only maintain but also expand their current offerings. This involves a dual approach focusing on both financial and non-financial benefits:

1. **Financial Incentives:** Continue to provide and, where possible, increase financial rewards such as extra allowances and bonuses. These should be tied to specific performance metrics like improved student academic results, perfect attendance, or participation in professional development programs.
2. **Non-Financial Incentives:** Beyond monetary rewards, schools should prioritize and formalize non-financial benefits. This could include providing transportation subsidies, establishing comprehensive medical grants, and offering other tangible benefits that reduce the personal financial burden on teachers. These benefits demonstrate institutional care and commitment, which in turn fosters teacher loyalty and dedication.

Recognition is a powerful tool for validating teachers' hard work and boosting their morale. Schools should develop a systematic approach to acknowledging and rewarding teacher excellence.

1. **Formal Recognition:** Implement formal recognition programs such as "Teacher of the Month" or "Excellence in Teaching" awards. These can be accompanied by public ceremonies, certificates, and even small monetary prizes. Promotions should also be used as a key form of recognition for consistently high-performing teachers, providing a clear career path.
2. **Informal Recognition:** Encourage a culture of regular and immediate recognition. School principals and heads of departments should be trained to provide timely verbal appreciation and positive feedback to teachers. A simple "thank you" or a note of praise can significantly boost a teacher's spirits and reinforce their value.

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Assessment of Psycho-Social Behaviours Among HIV/Aids Patients in General Hospitals in Sokoto State, Nigeria: Implication for Health Counselling

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Abstract

This research investigated the psycho-social behaviors of HIV/AIDS patients attending General Hospitals (GHs) in Sokoto State, Nigeria. Three research questions and two null research hypotheses were raised to guide the study. Cross-sectional descriptive research design was employed for the study. Population of the study comprised of 1,155 HIV/AIDS patients. The sample of the study consists of 275 HIV/AIDS patients purposively selected. Convenient sampling technique was also used to sample 30 counselors from 3 tertiary institutions in the state. The instrument for data collection was a questionnaire which was validated by experts and had reliability index of 0.78. The data collected were analyzed using descriptive statistics such as mean, standard deviation and ANOVA. The findings from the study revealed that HIV/AIDS patients attending GHs in Sokoto State demonstrate moderate psycho-social behaviors across personal, social and cognitive domains. Also, there is: no significant gender difference in psycho-social behaviors, but significant difference in counselling needs of HIV/AIDS patients attending GHs in Sokoto State. It was recommended that government should strengthen ongoing health education and behavioral reinforcement programs to sustain and improve personal psycho-social practices among patients. Government and non-governmental organizations should increase funding and institutional support to expand access to psycho-social services.

Keywords: Psycho-social Behaviors, HIV/AIDS Patients, Counselling.

Introduction

People living with HIV/AIDS face tremendous health risks from opportunistic infection, which dramatically increase their risk of death, weight loss as a

result of excessive stooling, loss of appetite, fatigue, tuberculosis, cancer, ulcerated genital organs, (National Institute of Health, 2021). However, regular medication for opportunistic infections can substantially prolong the life of the patients. HIV/AIDS is not contagious. It cannot be contracted through hugging, shaking of hands, touching, sharing cloths, dishes, toilet seats, eating together, and sitting close to an infected person (Medical News Today, 2023). There is negligible transmission through nasal secretion, sweat, tears, urine and saliva unless they contain visible blood. (Bolori, et.al 2017) An individual's immune system is harmed by HIV, and it also has an impact on their mental health. (Asante, 2018). HIV/AIDS patients deal with a variety of difficult issues related to their well-being, social, and health, employment challenges, and family. The biggest source of insecurities is that people with HIV are stigmatized and scared (Fauk, Hawke, Mwanri & Ward, 2021). Therefore, it is crucial to counsel HIV at the moment of diagnosis in order to effectively handle the child's psychological problems.

Psycho-social behaviors refer to the interaction between an individual's psychological state and their social environment, which influences their thoughts, emotions, and actions (Smith & Jones, 2023). These behaviors encompass a wide range of activities, from interpersonal interactions to how individuals respond to societal expectations, norms, and pressures. Psycho-social behaviors are often studied to understand how individuals navigate social systems, form relationships, and manage internal states like stress, anxiety, or happiness. (Chastain, 2022). The term "psycho-social" highlights the interconnectedness of psychological and social factors in shaping human behavior. Psychological factors include aspects like cognition, emotions, and mental health, while social factors pertain to relationships, culture, and societal influences (Harris, 2022). These behaviors manifest in everyday situations, such as how one behaves in a group, their coping strategies in response to social pressures, or how they express emotions in various contexts. For example, in the workplace, psycho-social behaviors can influence job satisfaction, productivity, and stress management (UNAIDS (2024).

Persons Living with HIV/AIDS (PLWHA) often pass through lots of psycho-social problems which often leave some negative impacts on them. (Fauk, Hawke, Mwanri & Ward, 2021). Such a person may begin to grieve when thinking about being diagnosed with a potentially debilitating illness that can threaten his or her life or impair his or her functioning in the society. Other emotional responses to testing positive in HIV/AIDS include: shock, disbelief,

panic, fear, guilt, despair, hopelessness and numbed. Discussion on HIV/AIDS is in many third-world countries still accompanied by taboo, misunderstandings, shame, guilt and rejection. Culturally conditioned silence about sexuality, sexual behaviour conceals risky sexual behaviour and sexual abuse and especially sexual abuse of children. Due to cultural, religious and legal aspects of the topic is HIV/AIDS, death, sexuality, the discussion is led only by a small group of experts. Rejection or lack of awareness about HIV/AIDS significantly limits the ability of effective and decent care for HIV-positive people and their families. It is very important to speak about HIV/AIDS loudly, to speak about the feelings and reactions of people living with HIV/AIDS. (Ubandawaki, 2022).

Sokoto state has 12,651 HIV patients in its register out of which 11,707 of them were placed on treatment and receiving anti-retroviral drugs at designated centers approved by the state government around the state. (Ubandawaki, 2022). The current spate of the disease is moving at a slow rate of about 0.4 percent which shows that awareness and advocacy campaigns by the state and some concern groups is working assiduously (Ubandawaki, 2022). Clinical counselling for HIV/AIDS is a key component of HIV therapy. It talks about the psychological and social needs of those who have HIV or AIDS. Clinical therapy is the best technique to assist a patient in coping with this condition and its implications (Fauk, Hawke, Mwanri & Ward, 2021). This research investigated the psycho-social behaviour and counselling needs of HIV/AIDS patients in public hospitals in the state.

Statement of the Problem

People living with HIV/AIDS in Sokoto State face significant psycho-social challenges that impact their emotional well-being, social relationships, and quality of life. These challenges are often rooted in fear of stigma and discrimination, leading to social withdrawal, anxiety, and depression. Such fears discourage patients from disclosing their HIV status or seeking support, resulting in isolation and psychological distress. In addition to these personal struggles, healthcare systems in Sokoto State are often ill-equipped to provide adequate psycho-social support, with limited counselling services and insufficiently trained personnel. (Ubandawaki, 2022). As a result, patients frequently receive treatment that addresses only the physical symptoms of HIV/AIDS, while their emotional and relational needs are neglected. These

psycho-social difficulties extend to family life, as misunderstandings and fear of transmission can strain relationships.

Despite the significance of these issues, there is inadequate empirical research in Sokoto State examining how psycho-social behaviours and counselling needs vary across different demographic groups. After conducting systematic review of existing research. Understanding these variations is crucial for developing inclusive, culturally sensitive, and effective interventions. This study, therefore, explores the psycho-social behaviours and counselling needs of HIV/AIDS patients in general hospitals across Sokoto State, to inform the planning and delivery of more holistic support services.

Objectives of the Study

The objectives of this study are to:

1. find out the psycho-social behaviours of HIV/AIDS patients attending General Hospitals in Sokoto state?
2. find out the difference in psycho-social behaviors of male and female HIV/AIDS patients attending General Hospitals in Sokoto state.
3. examine the difference in the counselling needs of male and female HIV/AIDS patients attending General Hospitals in Sokoto state.

Research Questions

What are the psycho-social behaviours of HIV/AIDS patients attending General Hospitals in Sokoto state?

- a. Is there difference between the psycho-social behaviors of male and female HIV/AIDS patients attending General Hospitals in Sokoto state?
- b. Is there difference between the counselling needs of male and female HIV/AIDS patients attending General Hospitals in Sokoto state?

Null Hypotheses

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

- H₀₁: There is no significant difference between the psycho-social behaviors of male and female HIV/AIDS patients attending General Hospitals, Sokoto state.
- H₀₂: There is no significant difference between the counselling needs of male and female HIV/AIDS patients attending General Hospitals, Sokoto state.

Methodology

This study employed a cross-sectional descriptive research design. The population comprised 1,155 registered HIV/AIDS patients attending 20 general hospitals in Sokoto State.

Table 1: Population of the Study

S/N	General Hospital	No. of HIV patients
1.	General Hospital Binji	27
2.	General Hospital Bodinga	11
3.	General Hospital Gada	42
4.	General Hospital Goronyo	19
5.	General Hospital Balle	137
6.	General Hospital Gwadabawa	73
7.	General Hospital Illela	94
8.	General Hospital Isa	59
9.	General Hospital Kebbe	27
10.	General Hospital Kware	159
11.	General Hospital Rabah	93
12.	General Hospital Sabon Birni	74
13.	General Hospital Shagari	102
14.	General Hospital Silame	19
15.	General Hospital Dogon daji	61
16.	General Hospital Tambuwal	33
17.	General Hospital Tangaza	13
18.	General Hospital Tureta	7
19.	General Hospital Wurno	47
20.	General Hospital Yabo	58
	Total	1155

Source: SOSACAT, 2024.

However, the study focused on 13 selected general hospitals. A total sample size of 275 HIV/AIDS patients was drawn using proportionate and purposive sampling techniques to ensure relevance and representativeness.

Table 2: Sample of the Study

S/N	General Hospital	Population of HIV Patients	No. of HIV Patients Sample
1.	General Hospital Bodinga	11	4
2.	General Hospital Gada	42	16
3.	General Hospital Goronyo	19	7
4.	General Hospital Balle	137	52
5.	General Hospital Gwadabawa	73	28
6.	General Hospital Illela	94	36
7.	General Hospital Kebbe	27	10
8.	General Hospital Kware	159	60
9.	General Hospital Rabah	93	11
10.	General Hospital Silame	19	7
11.	General Hospital Dogon daji	61	23
12.	General Hospital Tureta	7	3
13.	General Hospital Wurno	47	18
	Total		275

Additionally, 30 counsellors from three tertiary institutions in Sokoto State were selected through convenient sampling to provide insights into patients' counselling needs. The instrument used was a researcher-designed questionnaire titled *Psycho-social Behaviours and Counselling Needs of HIV/AIDS Patients Questionnaire (PBCNHPQ)*. It contained three sections: Section A on demographic data, Section B on psycho-social behaviours (using a 5-point rating scale), and Section C on counselling needs (using a 4-point Likert scale). Sections A and B were completed by the patients, while Section C was reserved for the counsellors. Validation and reliability of the instrument were ensured through expert review, yielding a Content Validity Index (CVI) of 1.64 and a Kapper Value (KV) of 0.75. A pilot test with 15 patients outside the sample refined the tool. Test-retest reliability produced a Pearson correlation coefficient of 0.78, confirming the instrument's reliability. Data collection involved in-person administration of questionnaires, with research assistants translating into Hausa when necessary. Ethical considerations such as confidentiality and voluntary participation were upheld. For data analysis, descriptive statistics (mean and standard deviation) was used to analyses research question one while inferential statistics (ANOVA) using SPSS (v20) was employed to test the research hypotheses.

Results

The analysis of the research items for each of the research questions was done using mean and standard deviation. Since the instruments for the research were designed using a rating and Likert scale, the mean benchmark for

answering the research items for each of the instruments is 2.5 criterion mean as follows:

Table 3: Criteria for Analyzing the Responses

Range		Remakr
1 – 1.49	=	Very Low
1.50 – 2.49	=	Low
2.50 – 3.49	=	High
3.50 – 4.00	=	Very High

The data were presented and analyzed in line with the research questions as shown in Tables below.

Research Question One: What are the psycho-social behaviours of HIV/AIDS patients attending General Hospitals in Sokoto state?

The results on the psycho-social behaviours of HIV/AIDS patients attending General Hospitals in Sokoto state is shown in Table 4.

Table 4: Psycho-social Behaviours of HIV/AIDS Patients Attending General Hospitals in Sokoto state (N = 275)

S/N	Psycho-social Behaviour	Mean	Std. Dev.	Remark
<i>Personal Behaviours</i>				
1.	I take my HIV/AIDS medications exactly as prescribed by my healthcare provider.	2.51	1.39	High
2.	I maintain a balanced and nutritious diet to support my immune system.	2.69	.84	High
3.	I maintain a balanced and nutritious diet to support my overall health.	2.72	.79	High
4.	I engage in regular physical activity or exercise to improve my well-being	2.77	.69	High
5.	I engage in activities (e.g., meditation, hobbies, relaxation) to reduce stress in my life.	2.77	.77	High
6.	I avoid harmful habits such as smoking, alcohol consumption, or drug use.	2.72	1.10	High
7.	I take precautions (e.g., using protection during sex) to prevent transmission of HIV/AIDS to others.	2.55	.98	High
<i>Mean Score of Personal Behaviours</i>		2.68	.70	High
<i>Social Behaviour</i>				
8.	I seek emotional or practical support from family or friends when I need it.	2.68	.80	High
9.	I participate in social or community activities despite my HIV/AIDS status.	2.72	.82	High
10.	I openly share my HIV status with people I trust.	2.00	.96	Low
11.	I avoid situations where I feel judged or stigmatized due to my HIV/AIDS status.	2.69	.58	High
12.	I maintain healthy relationships with friends, family, and significant others.	2.66	.76	High

13.	I attend HIV/AIDS support group meetings or community gatherings.	2.79	.80	High
14.	I feel accepted by society despite my HIV/AIDS status.	2.64	.77	High
	<i>Mean Score of Social Behaviours</i>	2.60	.61	High
	<i>Cognitive Behaviour</i>			
15.	I actively seek information to better understand HIV/AIDS and its management.	2.77	.65	
16.	I use positive thinking to cope with the challenges of living with HIV/AIDS.	2.56	.70	High
17.	I feel hopeful about my future despite my HIV/AIDS status.	2.63	.65	High
18.	I carefully think through decisions that may affect my health and well-being.	2.57	.60	High
19.	I find it easy to focus and remember things related to my daily routine and treatment plan.	2.65	.69	High
20.	I remind myself of the importance of staying consistent with my treatment.	2.51	.81	High
21.	I can concentrate on daily tasks without feeling overwhelmed by my health status.	2.38	.88	Low
	<i>Mean Score of Cognitive Behaviours</i>	2.58	.49	High

Source: Fieldwork, 2025

Table 4 presents the summary results of the psycho-social behaviours of HIV/AIDS patients attending general hospitals in Sokoto State based on three domains: personal behaviours, social behaviour and cognitive aspects. The results show that personal behaviours domain has the highest mean score of 2.68 with a standard deviation of 0.70, indicating that patients exhibit high levels of personal behavioural responses related to their HIV/AIDS status. These behaviours include taking prescribed HIV/AIDS medications, maintaining balanced and nutritious diets, undergoing physical activities or exercises, engaging in activities like hobbies and relaxation to reduce stress, avoiding harmful habits such as smoking, alcohol consumption or drug abuse and taking precautions like using protection during sex to prevent transmission. The relatively higher mean suggests that personal responses to the condition are more prominent or visible among the patients compared to the other domains.

Social behaviour had mean score of 2.60 and a standard deviation of 0.61. This implies that patients also show a high level of social behaviours like seeking emotional or practical support from family or friends, participating in social or community activities, sharing HIV status with people, avoiding situation leading to being stigmatized or judged, attending HIV/AIDS support group meetings or community gathering or feeling accepted by the society. While the mean is slightly lower than that of personal behaviours, it still reflects noticeable social dynamics influenced by the condition.

The cognitive domain has the lowest mean score of 2.58 and the smallest standard deviation of 0.49, suggesting relatively consistent but slightly less expressed cognitive responses. These include seeking information to better understand HIV/AIDS and its management, positive thinking on coping mechanisms, feeling hopeful, think through decision affecting health, focus and remember things related to daily routine and treatment plans, reminisce on importance of staying consistent with treatment and concentrate on daily task without feeling overwhelmed. The lower standard deviation in this domain also indicates less variability in responses, meaning that most patients tend to think similarly about their situation.

These findings suggest that HIV/AIDS patients in Sokoto State demonstrate some level of psycho-social behaviours across personal, social, and cognitive domains, with personal behaviours being the most pronounced. The closeness of the mean scores across domains also reflects a holistic psycho-social experience, where behaviour, social interaction and thought patterns are interrelated in shaping how patients live with HIV/AIDS.

Null Hypotheses Testing

The null hypotheses were tested using Analysis of Variance (ANOVA) as shown below.

Null Hypothesis One: There is no significant difference between the psycho-social behaviors of male and female HIV/AIDS patients attending General Hospitals, Sokoto state.

This hypothesis was tested at 0.05 level of significance presented in Table 5.

Table 5: ANOVA Results for the Difference Between the Psycho-social Behaviors of Male and Female HIV/AIDS Patients Attending General Hospitals, Sokoto state

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	.002	1	.002	.006	.937	H ₀₁ Accepted
Within Groups	69.032	273	.253			
Total	69.034	274				

Table 2 shows the results of the Analysis of Variance (ANOVA) for the difference between the psycho-social behaviors of male and female HIV/AIDS patients attending General Hospitals, Sokoto state. From the ANOVA table, the F-value is 0.006 and the corresponding p-value (Sig.) is 0.937. Since the p-value is greater than 0.05, the result is not statistically significant. This means

that there is no meaningful difference in psycho-social behaviours between male and female patients within the sample. Therefore, the null hypothesis is retained, indicating that gender does not significantly influence the psycho-social behaviours of HIV/AIDS patients attending general hospitals in Sokoto State.

Null Hypothesis Two: There is no significant difference between the counselling needs of male and female HIV/AIDS patients attending General Hospitals, Sokoto state.

This hypothesis was tested at 0.05 level of significance presented in Table 6.

Table 6: ANOVA Results for the Difference in Counselling Needs of Male and Female HIV/AIDS Patients Attending General Hospitals, Sokoto state

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	.702	1	.702	6.652	.015	H ₀₂
Within Groups	2.953	28	.105			Rejected
Total	3.655	29				

The results of null hypothesis two are presented in Table 7 using ANOVA at a 0.05 level of significance. The F-value is 6.652 and the p-value (Sig.) is 0.015. Since the p-value is less than 0.05, the result is statistically significant. Therefore, the null hypothesis is rejected, and it is concluded that there is a statistically significant difference between the counselling needs of male and female HIV/AIDS patients attending general hospitals in Sokoto State. This means that gender influences the type or extent of counselling support needed, and therefore, gender-sensitive counselling approaches may be necessary to adequately address the distinct psychological and emotional needs of male and female patients.

Summary of Major Findings

The following are the major findings of the study:

1. HIV/AIDS patients attending general hospitals in Sokoto State demonstrate high level of psycho-social behaviours across personal, social and cognitive domains, with personal behaviours being the most pronounced.
2. Gender does not significantly influence the psycho-social behaviours of HIV/AIDS patients attending general hospitals in Sokoto State as

both male and female patients exhibit similar psycho-social responses to living with HIV/AIDS.

3. There is a statistically significant difference between the counselling needs of male and female HIV/AIDS patients attending general hospitals in Sokoto State.

Discussion

The findings from research question one shows that HIV/AIDS patients attending general hospitals in Sokoto State demonstrate high level of psycho-social behaviours across personal, social and cognitive domains, with personal behaviours being the most pronounced. This finding finds empirical support in related studies. For instance, Stein and Nyamathi (2020) reported that both male and female HIV-positive individuals displayed high level of engagement in behaviours that reflect self-care and positive coping strategies, such as injection drug avoidance, increased AIDS knowledge, social support, and adherence to medical advice, with women showing slightly more proactive behaviours in terms of self-care and risk perception.

Similarly, Golrokhi *et al.* (2023) found that HIV-positive patients used both problem-focused and emotion-focused coping strategies, with problem-focused strategies (including health-conscious personal routines and therapy compliance) being associated with better psychological outcomes. This aligns with the current research's indication that personal behaviours, like taking medications, practicing safe sex, and avoiding substance abuse, are the most developed among the psycho-social domains. Moreover, the study by Olusakin and Agbomian (2017) also supports this finding by showing that HIV/AIDS patients who underwent group counselling displayed improved psycho-social adjustment, particularly in areas related to personal responsibility for health and well-being. These studies, in various contexts, affirm the current research's observation that while social and cognitive behaviours exist at moderate levels, personal psycho-social behaviours remain the most actively demonstrated by HIV/AIDS patients.

Findings from research hypothesis one revealed that gender does not significantly influence the psycho-social behaviours of HIV/AIDS patients attending general hospitals in Sokoto State implying that both male and female patients exhibit similar psycho-social responses to living with HIV/AIDS and gender-specific interventions may not be necessary in this context. This

finding is consistent with findings from previous related studies. For instance, the study by Olusakin and Agbomian (2017) revealed no significant gender difference in the psycho-social adjustment of HIV/AIDS patients following group counselling interventions. Similarly, Ushie *et al.* (2016) found no significant gender variation in the psycho-social behaviours of HIV/AIDS patients exposed to group counselling in Cross River State. Their result reinforces the idea that gender may not be a strong determinant of how patients respond to psychological and behavioural challenges associated with the condition.

Furthermore, Golrokhi *et al.* (2023) observed that although some psycho-social issues like depression and anxiety were prevalent among HIV-positive patients, both men and women demonstrated similar coping strategies such as problem-focused and emotion-focused approaches. This further supports the conclusion that psycho-social behaviours are not significantly gendered. Also, Sargolzaei *et al.* (2018) reported that while there were slight differences in psychological health scores, these were not substantial enough to warrant gender-specific intervention. Instead, psycho-social wellbeing was more closely associated with the level of social support and disease progression. These findings affirm that HIV/AIDS patients, regardless of gender, tend to exhibit similar psycho-social patterns and would likely benefit equally from general counselling interventions without the need for gender-based modifications.

Findings from research hypothesis two also revealed that there is a statistically significant difference between the counselling needs of male and female HIV/AIDS patients attending general hospitals in Sokoto State, implying that gender influences the type or extent of counselling support needed. This result aligns with the study by Mwaura (2022), which found that gender significantly influenced self-acceptance among people living with HIV/AIDS, with female patients often facing greater psychological challenges and benefiting more from counselling interventions. Similarly, Golrokhi *et al.* (2023) reported that depression, anxiety, and stress were prevalent among HIV-positive individuals and that these psychological conditions were significantly associated with gender. Women in their study showed higher vulnerability to these conditions, underscoring the need for gender-sensitive counselling that addresses specific mental health concerns.

In addition, Sargolzaei *et al.* (2018) found that female patients had lower psychological well-being scores than males and often had less access to social support systems. This further supports the notion that women may require more intensive or tailored counselling services to address both emotional and structural barriers in coping with HIV. Moreover, Nobakht *et al.* (2018) provided evidence that cognitive-behavioural therapy was especially effective for women with HIV in managing depression, anxiety, and stress. Their results demonstrated that targeted counselling interventions could significantly improve psychological outcomes, highlighting the need to consider gender when designing counselling programmes. These studies reinforce the finding from the current research that gender influences the counselling needs of HIV/AIDS patients. While psycho-social behaviours may be similar across genders, the specific emotional burdens, societal roles and support systems experienced by men and women create distinct counselling demands.

Conclusion

HIV/AIDS patients attending General Hospitals in Sokoto State, Nigeria, exhibit psycho-social behaviours across personal, social and cognitive dimensions, with personal behaviours being the most evident. These behaviours include health-promoting practices such as medication adherence, balanced nutrition, physical activity, stress reduction and risk-avoidance behaviours. Also, psycho-social interventions, particularly individual counselling and educational programmes, are considered highly effective in supporting patient well-being. Coping strategies such as stress management and adherence to antiretroviral therapy (ART) were also shown to be beneficial, though economic and systemic challenges were noted to hinder consistent implementation.

In terms of demographic influences, gender did not significantly affect psycho-social behaviours, indicating that both male and female patients respond similarly to the psychological and social challenges posed by HIV/AIDS.

However, a significant difference was found in the counselling needs of male and female patients, suggesting variations in the emotional or psychological support each gender requires.

Recommendations

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

1. Government should strengthen ongoing health education and behavioural reinforcement programs to sustain and improve personal psycho-social practices among patients.
2. Government and non-governmental organizations (NGOs) should increase funding and institutional support to expand access to psycho-social services and remove financial barriers to effective coping strategies.
3. Stakeholders such as [AIDS Prevention Initiative in Nigeria (APIN), Network of People Living with HIV and AIDS in Nigeria (NEPWHAN), Society for Family Health (SFH), The Nigerian Red Cross Society (NRCS)] should implement gender-inclusive psycho-social interventions since both male and female patients show similar behavioural responses.

Implication for Health Counselling

1. The findings have direct implication for healthcare practitioners, policymakers and program designers. The high level of psycho-social behaviour indicates the need for continuous psycho-social support, especially in the social and cognitive domains.
2. The differentiated counselling needs based on gender suggest that interventions should be tailored to specific patient characteristics. Therefore, a holistic, inclusive, and culturally sensitive support system is required, one that accounts for financial, emotional and relational realities of HIV/AIDS patients.
3. Individual counselling and educational interventions are especially valued, implying that personalized and information-based strategies are effective for this population. These insights can guide the development of more effective, targeted and equitable psycho-social support programs within general hospitals in Sokoto State.

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Appraisal of Improvisational Teaching on Students' Problem-Solving Skills in Chemistry

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Abstract

Improvisational teaching, which involves adapting instructional strategies based on real-time classroom dynamics and students' needs, has gained recognition as an effective pedagogical approach in enhancing student learning outcomes, particularly in chemistry education. This paper explores the role of improvisational teaching in fostering problem-solving skills, critical thinking, and active student engagement. By contrasting traditional, predetermined curricula with improvisational methods, the study highlights the advantages of flexibility and responsiveness in teaching. Key strategies such as role-playing, improvisational experiments, chemistry charades, peer teaching, and the Think-Pair-Share method are examined in the context of chemistry education, demonstrating how these approaches encourage creativity, collaboration, and deep conceptual understanding. Furthermore, the paper discusses the impact of improvisational teaching on student confidence, adaptability, and communication skills, all of which are vital for academic success and future professional endeavors. Supported by recent research, including studies on the application of improvisational techniques in science classrooms, the findings suggest that improvisation enhances student engagement, improves problem-solving abilities, and cultivates a passion for inquiry and discovery. The integration of improvisational teaching in chemistry classrooms not only prepares students for academic success but also equips them with essential competencies required in the modern workforce.

Keywords: Improvisational teaching, Traditional teaching, Problem solving skills, chemistry

Introduction

Improvisational teaching, defined as the ability of educators to adapt and modify instructional strategies in response to students' needs and real-time classroom dynamics, has garnered attention for its potential to enhance learning outcomes. In the context of chemistry education, which inherently involves complex problem-solving and critical thinking, improvisational teaching methods offer a promising approach to develop students' problem-solving skills. This paper argues that improvisational teaching positively influences students' ability to solve problems in chemistry, supported by recent

research and expert opinions. Improvisational teaching, characterized by the flexibility of educators to adapt instructional strategies based on students' immediate needs and classroom dynamics, has been identified as an effective approach in enhancing problem-solving skills (Ngendabanga et al., 2025). In chemistry education, where complexity and critical thinking are fundamental, improvisational techniques provide students with opportunities to actively engage with content, fostering creativity and deeper understanding (Ndukwe, 2021). Recent studies have shown that students exposed to problem-solving strategies often implemented through improvisational teaching demonstrate significantly higher performance in chemistry assessments compared to those taught using traditional lecture methods (Jegede & Fatoke, 2014). For example, the use of improvised chemicals and materials in resource-constrained environments has been linked to increased student motivation and academic achievement, suggesting that improvisational teaching not only enhances engagement but also deepens conceptual understanding (Ngendabanga et al., 2025)

This study aims to explore the impact of improvisational teaching on students' problem-solving abilities in chemistry, synthesizing key findings from recent research, expert opinions, and case studies. The evidence suggests that when educators embrace flexibility and responsiveness in their instructional methods, students are better equipped to tackle complex chemical problems, apply theoretical knowledge in practical contexts, and develop critical thinking skills essential for scientific inquiry

Traditional chemistry teaching often relies on predetermined curricula and structured approaches that may not fully engage students in the problem-solving process. Conventional methods typically emphasize rote learning and procedural knowledge, which can limit opportunities for students to practice and develop critical thinking skills essential for solving complex chemical problems. As Stroumpouli and Tsaparlis (2022) notes, traditional instruction tends to focus on algorithmic problem-solving and memorization, often neglecting the deeper cognitive processes required for conceptual understanding and analytical reasoning. Traditional chemistry teaching methods predominantly rely on fixed curricula and structured pedagogies. These methods often prioritize rote memorization and procedural learning over active engagement, limiting students' opportunities to develop higher-

order cognitive skills essential for solving complex chemical problems. As highlighted by the Royal Society of Chemistry, traditional lectures and laboratory formats often fail to support diverse learners in grasping abstract chemical concepts, calling for more interactive and blended approaches to foster deeper understanding (Royal Society of Chemistry, 2024). In contrast, improvisational teaching promotes a dynamic learning environment where the instructor's adaptability facilitates spontaneous problem-solving, critical thinking, and student engagement (Kaufman, 2020). This study investigates the shift from conventional approaches toward improvisational teaching, highlighting its alignment with contemporary educational practices emphasizing active learning.

1. A pre-determined curriculum refers to an educational plan or framework that is established before teaching begins, outlining what will be taught, in what order, and the learning objectives to be achieved. It is typically developed by educational authorities or institutions and is designed to ensure consistency and standardization across different classrooms or schools. According to the Glossary of Education Reform, a pre-determined curriculum is "a curriculum that is set in advance and outlines the specific knowledge and skills that students are expected to learn during a particular course or educational program." This type of curriculum is often contrasted with a more flexible or student-centered approach that might be adapted based on students' needs and interests.
2. Structured methodologies are the systematic, organized approaches used in various fields to achieve specific goals or manage complex processes. These methodologies provide a framework for how tasks should be performed, ensuring consistency, efficiency, and effectiveness.
3. Problem-solving skills refer to the ability to identify, analyze, and resolve issues effectively and efficiently. These skills involve a range of cognitive processes and strategies that enable individuals to tackle challenges and find solutions to various problems

In contrast, improvisational teaching involves adjusting instructional approaches based on students' responses, fostering a more dynamic and interactive learning environment. This method aligns with contemporary educational practices that emphasize active learning and student engagement,

critical for subjects like chemistry that demand high-level problem-solving abilities (Kaufman, 2020).

Statement of the Problem

In traditional chemistry education, students often face challenges in developing critical problem-solving skills due to the reliance on pre-determined curricula and structured instructional methods. These conventional approaches tend to emphasize rote memorization and procedural learning, which may limit opportunities for students to engage deeply with complex chemical problems and develop the higher-order cognitive skills necessary for real-world application. As chemistry inherently involves complex problem-solving and critical thinking, there is a growing need for innovative teaching methods that foster active student engagement, creativity, and adaptability.

Improvisational teaching, characterized by its flexibility and adaptability to students' needs and classroom dynamics, has emerged as a promising alternative to conventional teaching strategies. However, despite its potential, there is limited empirical evidence that directly links improvisational teaching to improved problem-solving skills in chemistry education. The current gap in research highlights the need to explore how improvisational teaching methods can effectively enhance students' ability to solve complex chemical problems and develop the critical thinking skills essential for success in both academic and professional settings.

This study aims to address this gap by investigating the impact of improvisational teaching strategies on the development of problem-solving skills in chemistry classrooms. Specifically, it will examine how techniques such as role-playing, improvisational experiments, chemistry charades, peer teaching, and Think-Pair-Share influence student engagement, collaboration, confidence, and real-time problem-solving abilities. By synthesizing findings from recent research, expert opinions, and case studies, this paper seeks to establish the efficacy of improvisational teaching in fostering critical thinking and problem-solving skills in chemistry education.

Origin of Improvisational Teaching

Improvisational teaching methods have gained traction as effective strategies for enhancing creativity and engagement in the classroom. Originating from the realms of theater and educational theory, these methods emphasize

spontaneity and active participation. Key figures such as Viola Spolin and Keith Johnstone have shaped these approaches, providing valuable frameworks that educators can adapt across various subjects. Their work, alongside contributions from theorists like John Dewey and contemporary educators, illustrates the ultimate potential of improvisation to transform learning experiences, encouraging students to think critically and express themselves freely. (Spolin, 2021).

Strategies for Conducting Improvisational Teaching

This study synthesizes findings from several improvisational teaching strategies employed in chemistry classrooms, including:

1. **Role-Playing Scenarios:** Role-playing scenarios immerse students in real-world scientific contexts, encouraging collaboration, critical analysis, and contextual understanding. Evidence suggests that role-play fosters a deeper connection to chemical concepts and enhances essential skills like public speaking and teamwork (Berk, 2009). Students actively participate in simulations of chemical processes, enriching their comprehension and encouraging independent thought.
2. **Improvisational Experiments:** By allowing students to design their own experiments within a flexible framework, improvisational experiments stimulate creativity and innovation. These activities align with constructivist theories that value active, hands-on learning (Tishman & Perkins, 2022). Research supports the efficacy of improvisational experiments in enhancing problem-solving skills and fostering critical thinking, as students develop and test their hypotheses using various scientific techniques (Kolb, 2021).
3. **Chemistry Charades:** The use of body language to represent chemical processes in chemistry charades enhances kinesthetic learning and deepens understanding. Research indicates that engaging in non-verbal representations of chemical concepts improves retention and promotes teamwork, which supports the broader cognitive and social development of students. Kinesthetic and multimodal strategies—such as physical dramatization of molecular interactions have been shown to enhance conceptual grasp and collaborative learning in chemistry classrooms (Taber, 2018).

4. **Peer Teaching:** In peer teaching, students take on the role of educators, reinforcing their own understanding while teaching peers. This method promotes student engagement, builds communication skills, and fosters a collaborative learning environment. Studies have shown that peer teaching enhances both academic achievement and personal development. For example, class-wide peer tutoring (CWPT) has been found to significantly improve students' achievement in chemistry compared to traditional lecture methods, while also promoting gender equity and collaborative learning (Nwafor et al., 2024).
5. **Think-Pair-Share:** This strategy, where students reflect individually, discuss in pairs, and share with the class, has been widely recognized for enhancing student participation and critical thinking. Evidence suggests that Think-Pair-Share supports the development of collaborative and communication skills, helping students articulate and refine their ideas while learning from diverse viewpoints (Smith & Alexander, 2023; Maughan & Dinsmore, 2022).

Impact of Improvisational Teaching on Problem-Solving Skills

Improvisational teaching significantly enhances problem-solving skills in chemistry education by fostering a flexible learning environment that emphasizes critical thinking and adaptability. This section summarizes key findings from multiple studies:

1. **Engagement and Motivation:** Improvisational teaching methods promote active student participation, leading to higher engagement levels. According to research by Kuhblman and Goodman (2016), students involved in improvisational tasks are more likely to explore new ideas, take intellectual risks, and engage deeply with course material. This enhanced engagement directly correlates with improved problem-solving capabilities.
2. **Collaboration and Communication:** Collaborative methods, such as role-playing and peer teaching, promote teamwork and communication, crucial for developing problem-solving skills. Baird and Gibbons (2017) note that improvisational strategies break down barriers between students, fostering an inclusive environment where

diverse perspectives are encouraged. This collaboration enhances students' ability to address complex problems through shared insights.

- 3. Confidence and Adaptability:** Improvisational teaching reduces student anxiety, creating a safe space for experimentation and intellectual risk-taking. Dempsey (2018) highlights that when students feel confident in their abilities, they are more likely to persist through difficult problems, thus improving their problem-solving strategies. Improvisational teaching also develops adaptability, an essential skill in both academic and professional settings, where unforeseen challenges often arise.
- 4. Real-Time Problem Solving:** In chemistry classrooms, improvisational techniques such as modifying experimental procedures in response to student observations allow for immediate feedback and adjustment. This approach encourages critical thinking and creative problem-solving as students are required to address obstacles in real-time. According to Davis and Johnson (2022), such responsive teaching methods enhance student engagement and problem-solving skills, making learning more dynamic and effective.

Supporting Evidence

The effectiveness of improvisational teaching methods in fostering problem-solving skills is supported by various research studies:

The benefits of improvisational teaching in chemistry extend beyond problem-solving skills, including:

Research by Furtak and Ruiz-Primo (2012) supports the effectiveness of improvisational teaching in improving problem-solving skills. Their study found that students in inquiry-based and adaptive learning environments showed greater problem-solving proficiency and higher levels of scientific reasoning. This aligns with the principles of improvisational teaching, which emphasizes adaptability and real-time problem-solving.

Educational expert Dr. Steven Schwartz also supports the use of improvisational techniques, noting that "improvisational teaching methods align well with the goals of modern science education, particularly in fostering critical thinking and problem-solving skills" (Schwartz, 2021).

Benefits of Improvisational Teaching in Chemistry

1. **Enhanced Student Engagement:** Improvisational methods make chemistry learning more interactive and student-centered, improving engagement and motivation.
2. **Development of Critical Thinking and Flexibility:** Students exposed to improvisational tasks develop essential critical thinking and adaptability skills, as they are regularly faced with unexpected challenges.
3. **Deeper Understanding of Chemistry Concepts:** The dynamic nature of improvisational learning encourages students to apply their theoretical knowledge in diverse and real-world contexts, leading to a deeper understanding of scientific concepts (Zion et al., 2010).

Challenges and Limitations

While improvisational teaching offers numerous advantages, its implementation can pose challenges.

1. Teachers must be adept at making quick adjustments and may require additional training to effectively use improvisational methods.
2. Improvisational approaches may not be suitable for all learning environments, particularly in large classes or settings with rigid curricula (Boud, Cohen, & Sampson, 2014).
3. Some students may struggle with the less structured nature of improvisational teaching, which could affect their learning experience if not managed carefully. Balancing improvisational techniques with structured elements is essential to ensure all students benefit from the teaching approach.

Conclusion

This study concludes that improvisational teaching positively influences students' problem-solving skills in chemistry by fostering active participation,

creativity, and critical thinking. The flexibility inherent in improvisational methods enables students to engage deeply with content, improving their ability to solve complex problems. Future research should explore the long-term impacts of improvisational teaching on students' academic and professional success, as well as the best practices for integrating improvisational strategies into traditional chemistry curricula.

By continuing to evaluate and refine these teaching methods, educators can further enhance the effectiveness of chemistry education, equipping students with the skills necessary for both academic achievement and lifelong learning.

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Secondary School Students' Errors and Misconceptions in Understanding Algebraic Variables among Senior Secondary Schools in Sokoto State, Nigeria

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Abstract

This study investigated the students' errors and misconceptions in understanding algebraic variables among senior secondary schools in sokoto state, Nigeria. The study adopted survey research design using mixed method. Data were collected from a sample of 378 students which were selected from the total number of 32,298 SSII students in the 142 public senior secondary schools in Sokoto State. Two instruments were developed and validated by the experts. Students' Algebraic Error Test (SAET) and Algebraic Misconceptions Interview Questionnaire (AMIQ) with reliability coefficients of 0.82 and 0.86 were obtained respectively. Data collected were analyzed using descriptive statistics and thematic content analysis. Findings of this study revealed that, majority of the students had difficulties in understanding the algebraic variable and most of the errors committed by students are not ordinary errors per se rather are misconceptions. The identified categories of errors include: assigning labels, arbitrary values, verbs and constants for variables, misinterpreting of two variables, lack of understanding the concept of variable and forming wrong equations as answers. Based on these findings it was recommended that Mathematics teachers should involve their students in activities that will aid their learning algebraic variables. These will make students to be conscious of the various Algebraic variables, concepts and improve to overcome their errors and misconceptions.

Keywords: Algebraic Variable, Errors, Misconceptions, Interest

Introduction

Mathematics has been recognized as bedrock for successful functioning of all aspects of human endeavor and that no nation can achieve any measure of scientific and technological advancement without mathematics. The knowledge of mathematics is a basic pre-requisite in the quest for present day scientific and technological advancement. The idea of numbers, structures and

relationships which make mathematics connote stand out in medicine, business, education, agriculture, and every field of human endeavour (Ningsih, Lefrida & Murdiana, 2024). In the 21st century in particular, sound mathematical background is needed for life sustenance and workplace competence. Mathematics is the queen of science and a tool for scientific and technological advancement, an indispensable tool for effective use of electronic resources for national development. It is also a way to communicate ideas, and perhaps more than anything, it is a way of reasoning that is unique to human beings (Akissani, Kajuru, Falalu & Aliyu, 2025). However, Olutosin (2007) described mathematics as an instrument to ease or facilitate the learning of other subjects and that, the importance of mathematics permeates all aspects of human endeavour.

Algebra is described as the logical outgrowth of arithmetic (Egodawatte, 2011). According to Obunge & Adolphus (2024), Algebra as a branch of mathematics in which symbols (usually letters) represent unknown numbers in Mathematical Equations, Algebra allows the basic operations of arithmetic's, such as addition, subtraction, multiplication, and division, to be performed without using specific numbers. The history of Algebra began in ancient Egypt and Babylon, where people learned to solve linear and quadratic Equations as well as intermediate Equations where by several unknowns are involved. However, Algebra is extensive in concepts, forms, structure, and applications since it is studied at almost all educational levels (NCTM, 2019). Despite modifications in concept sequence, categories, complexity, and application, additionally, Algebra keeps its name throughout Secondary and Postsecondary Education. In Senior Secondary Schools, for instance, Algebra was split into Equations (Basic, Simultaneous and Quadratic), set theory, inequality, and variation, each of which needed distinct problem-solving strategies (Mary, Mihis and Ndethiu, 2016). More so, according to Adeniran and Lambaya, (2022), one type of thinking needed in mathematics is algebraic thinking, in the broadest sense, algebraic thinking consists of understandings series which is needed to interpret the world by translating information or events into the language of Mathematics in order to explain and predict the phenomena, theoretically or practically. Algebra is found in many areas of life, such as, bankers who study patterns for electronically transferred funds and computer experts use digit patterns and switch to give code for complex statements (Zakaria, Chin, & Daud, 2010).

An error is the deviation from a correct solution of a problem as contextualized in Mathematics. Errors could be found as a wrongly answer problems which have flaws in the process that generated answers (Stemele & Jina, Asvat, 2024). Mathematics teachers can directly teach the correct procedure for solving and doing Mathematics correctly. While, there are common errors that students made with performing algebraic processes, students may demonstrate errors that are individual specific, (Akissani, Kajuru, Falalu & Aliyu, 2025). Thus, Siagian, et al., (2021) attributed that most of the students understood an algebraic variable as something whose value is unknown, whilst some other students comprehend a variables as a substitute for something whose value is unknown. Among the factors that influence students' weaknesses in mathematics are from the knowledge base or basic concepts and skills from previous learning (Ling, Shahril, & An, 2016). Students who fail to master the necessary skills and ideas at any level of learning, can influence their achievement at the next level. Hence, it is vital for a teacher to make an assessment of teaching and learning in the classroom and try to identify the difficulties and errors that are often experienced by students.

Misconception is a view or opinion that is incorrect based on faulty thinking or an inadequate understanding. The word misconception refers to an incorrect idea that is based on a failure to understand a concept (Obunge & Adolphus, 2024; Pramesti & Retnawati, 2019; Tekin-Sitrava, 2017). Misconceptions in learning Mathematics is a common occurrence across different cohorts in the use of the equal sign, symbolism, letters of usage, vocabulary and the order of operation (Egodawatte, 2011). Teachers should embrace errors and misconceptions in their teaching and should not regard them as obstacles to learning but rather engage with them for better understanding of algebraic concepts by students. (Fitria & Susanto, 2023; Ndemo & Ndemo, 2018). Similarly, misconception indicates a person's wrong understanding, and it occurs repeatedly because it is resistant and can produce wrong results (Tooher & Johnson, 2020). In view of this, the present study deemed it necessary to investigate students' errors and misconceptions which need to provide clear an explanation about the state of situation in Sokoto state, for better selection of an appropriate approach to minimize the problem for better learning outcomes and improve algebraic thinking ability of the learners.

Statement of the Problem

Algebra as crucial component of Mathematics and also an efficient way of solving certain types of problems. In spite of the importance of algebra to mathematics, scientific and technological development, it is still notable that students' performance in algebra-related topics at internal and external examinations has remained considerably poor. According to the Chief Examiners' report on mathematics in Nigeria, it has been observed that the candidates showed weaknesses in algebra-related topics. As such, it is suggested that, teachers should endeavour to pay more attention to algebra-related topics (WAEC, 2023). However, students in secondary schools, particularly in senior secondary schools, have not explored the resourcefulness of algebraic concepts, as evidenced by their poor performance (Egodawatte, 2011). This tendency may be attributable to the difficulty of learning and comprehending algebraic process in senior secondary schools. Due to the above problems, the present study deemed it necessary to investigate the students' errors and misconceptions specifically in understanding algebraic variables in Sokoto State.

Theoretical Foundation

The theoretical foundation of this study includes learning disability theory and constructivist theory. Learning disabilities are disorders that affect one's ability to understand and do mathematical calculations, or direct attention, which can lead to errors and misconceptions. Experiential learning theory (ELT) as postulated by Kolb (2014) determined four phases of ELT namely concrete experience, reflective observation, abstract conceptualization and active experimentation. This four-stage learning cycle was demonstrated through (1) concrete experience, in which students gain experience by conducting an actual training needs assessment (TNA) of a specified target population through survey, (2) reflection and observation, in which the students reflect and review the results of the TNA process before deciding on the training type, objectives, as well as the content, (3) abstract conceptualization, in which the students begins to design the training module which includes the lesson plan, materials such as slides, evaluation sheets, activities and so on, based on the information gathered from the first stage, (4) active experimentation, whereby students conduct the planned training program for the targeted audience identified in the previous phase. The students are also

required to evaluate the effectiveness of the training program, followed by a reflection on the results achieved as well as areas for improvement.

Objectives:

The objectives of the study is to investigate students' errors and misconceptions in understanding algebraic variables among senior secondary schools in Sokoto state, Nigeria. Specifically, the objectives of the study are to:

1. identify the categories of errors made by senior secondary school students in understanding algebraic variables in Sokoto state, Nigeria.
2. explore the misconceptions made by senior secondary school students in understanding algebraic variables in Sokoto state, Nigeria.

Research Question

The following research questions guided this study:

1. What are the categories of errors made by senior secondary school students in understanding algebraic variables in Sokoto state, Nigeria?
2. What are the misconceptions made by senior secondary school students in understanding algebraic variables in Sokoto state, Nigeria?

Methodology

This study employed a descriptive survey research design using a mixed method which is characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data. The population of this study comprised all the 32,239 students from the 142 public senior secondary schools II in Sokoto State (M.O.E., 2024). However, the sample size of 378 Students was obtained using the table for determining sample size from the given population using Research Advisor (2006). The instrument for data collection used in this study consists of two different types of instruments, quantitative and qualitative for data collection. In a quantitative instrument, Students' Algebraic Errors Test (SAET) was used to collect quantitative data. The qualitative instrument, algebraic misconceptions

interview questionnaire (AMIQ) was used to explore students' misconception based on their answers obtained from the quantitative part. The purpose of interviewing is to enable the respondents to spell out their understanding of the concept (Best and Kahn, 2012). The interview was conducted two weeks after the test, and two (2) students were interviewed from selected school to identify their Misconceptions on the concept. The interview lasted between 20 to 30 minutes. Voice recorder via the smart phone were use and later transcribed. The instrument was validated by the experts and the reliability coefficients of SAET and AMIQ were obtained as 0.82 and 0.86 respectively. Data collected were analyzed using descriptive statistics and thematic content analysis.

Results

The results were presented based on the research questions as follows:

Research Question One

What are the categories of errors made by senior secondary school students in understanding algebraic variables?

Based on the analysis of the students' worksheet, the category of errors identified are presented in Table 1 below.

Table 1: Categories of Errors in Understanding of Algebraic Variables

S/N	Type of Errors	Number of incorrect answers	Percentage (%)
1	Assigning labels, values, or verbs and constants for algebraic variables.	67	18
2	Forming incorrect equations as answers	33	9
3	Lack of understanding the concept variable.	36	10
4	Misinterpreting the product of two variables	194	51

Table 1 shows the majority of errors 194(51%) in understanding of algebraic variables were due to misinterpreting the product of two variables. This indicated that students struggle with understanding the concept of multiplying variables which is a fundamental concept in algebra. The second most common error 67(18%) is assigning labels, values, or verbs and constants for variables, these indicates that students may not fully understand the concept of variable and how to label them, it values and concepts of variables correctly. The lack of understanding the concepts of variables 36(10%) and forming incorrect algebraic equations 33(9%) are also categories of errors.

These errors reveal that students might not have a solid foundation in algebraic concepts and may struggle with applying them to solve problems. As such, the types of categories of errors were shown in the Figure 1 below that provides a sample of students' scripts and their errors in understanding of algebraic variables.

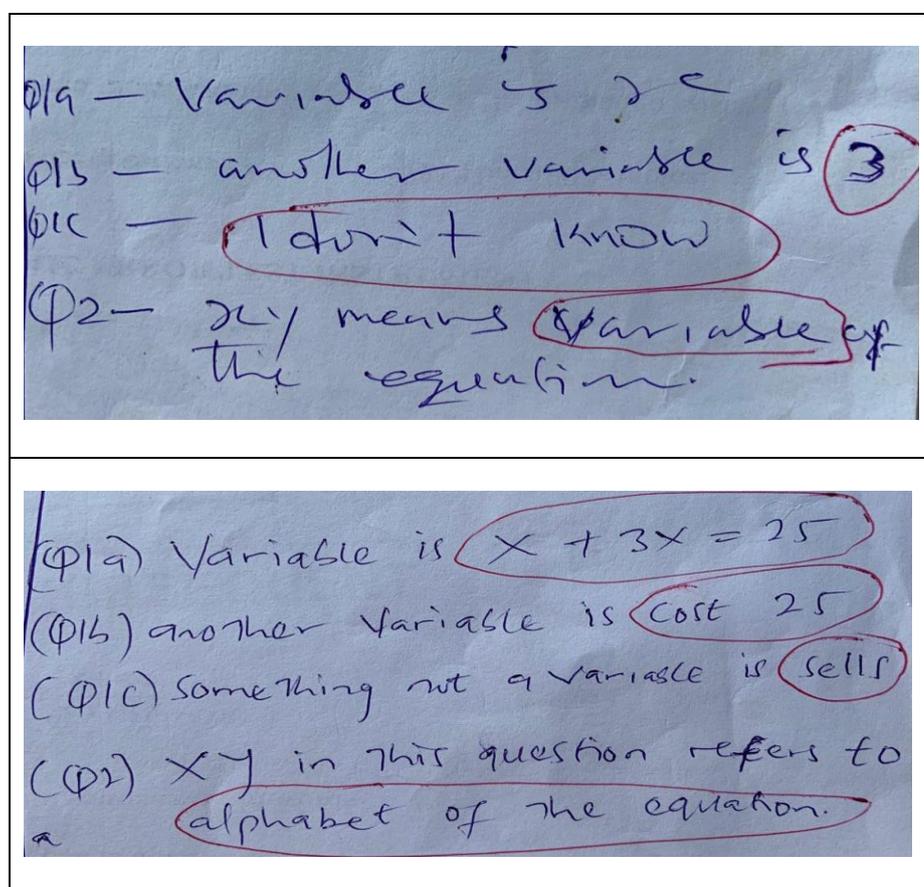


Figure 1: sample: of students' scripts based on question 1 and 2

Figure 1 indicated that students lacked understanding of the concept of algebraic variable by saying "I don't know" and when the participants were asked to name a variable and something that is not a variable as well as misinterpreted a variable as a 'label' by saying the variable is 3 or even as a verb such as 'sells'. The majority did not interpret the correct interpretation of the variable as the 'number of a thing'. It was also difficult for students to differentiate between a variable and a non-variable. The students were confused with and viewed variables as constants or vice-versa. This error was noticed when students were asked to name something in the question that was not a variable, the answer such as 'Bello' and 'Musa' were given. In a

general sense, these answers may be considered incorrect in the context of the given problem since there was a variable or a given number attached to it. Therefore, these words had meanings in the given context when they are taken together with those variables.

Another identified error in the variable was forming an incorrect equation as answers. Most of student's answers were both in the form of equations $x + 3x = 25$ and $x \times 3x = 25$. There was no meaning attached to these equations, and majority indicate a false relationship between the variables and constants in the problem. More so, it can be observed that, in question 2, majority had difficulties to interpret the product of two variables as two separate variables when combined by a sign. They viewed the product as one variable, constant and letter. Below in the Table 2 shows an average percentage of incorrect responses for students in understanding of algebraic variables.

Table 2 Average Percentage of incorrect Responses for "Understanding of Algebraic Variables"

Question Number	Number of Respondents	Number of Incorrect Answers	Percentage (%)	Average Percentage
1(a)	378	92	24	40
1(b)	378	188	50	
1(c)	378	128	34	
2	378	194	51	

Table 2 presented the percentages and average percentage of incorrect responses for understanding the variables, which revealed that 40% of the respondents out of 378, answered the questions incorrectly in solving problems related to algebraic variables.

Research Question Two

What are the Misconceptions made by Senior Secondary School Students in Understanding Algebraic Variables?

To answer the research question 2, interview was used, where R stands for researcher while S stands for the student who was the interviewee. The subsection below analysed the interview.

Interview transcript with the S₁

S₁ had a misunderstanding of the concept of a variable. The misconception was seen from answer for question 1(a), and 1(b). The student was asked to name variable in the question, and answered "x". Also, the respondent was

asked to give another variable in the question. Then, answered that there is no another variable as seen in Figure 2 below.

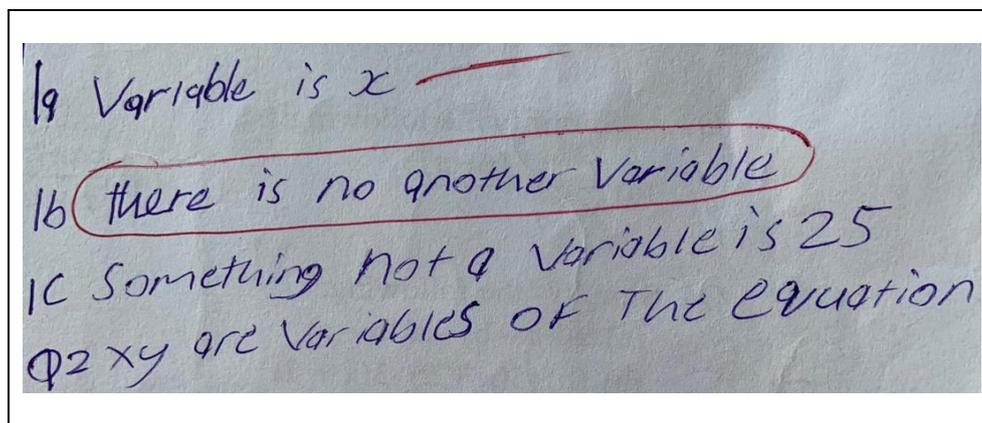


Figure 2: Extract of S₁ question 1 & 2

Figure 2 extracted from S₁. The answer given in the transcripts was by far contrary to the expected answer. The interview was carried out in order to find out about the S₁ understanding about the variable. The following shows the interview questions and responses with the S₁ and the researcher:

R: What is a variable?

S₁: A variable is a letter in an equation

R: Can a variable take values?

S₁: Yes, it takes values.

R: How many values can it take at a time?

S₁: One value at a time.

R: Why did you say there was no other variable in question 1(b)

S₁: Because the question contained only one letter X, no other letter.

R: When you have 5 mangoes and you give away two, how many remain?

S₁: 3 mangoes

R: Why didn't you say 3 without the mangoes?

S₁: Because it is 3 mangoes

R: How many variables are in $3y + 2y$?

S₁: One variable "y"

R: How many variables are in $3x + 2y$?

S₁: Two variables x and y.

R: What was your answer to question 2 that says; What does yz mean in $yz + 3$?

S₁: xy are variables

The S₁ answers show that there is a lack of understanding of the concept of algebraic variables by not perceiving the correct interpretation of the variable as the ‘number of a thing’. It was also difficult for S₁ to distinguish between variables and non-variables in terms of the varying and non-varying quantities in the question.

Interview transcript with the S₂

S₂ had a misunderstanding of the concept of a variable. The misconception was seen from answer for question 1(a) which were asked to name variable in the question, and answered $x + 3x = 25$. Also, misinterpret the product of two variables as a letter, as seen in Figure 3 below.

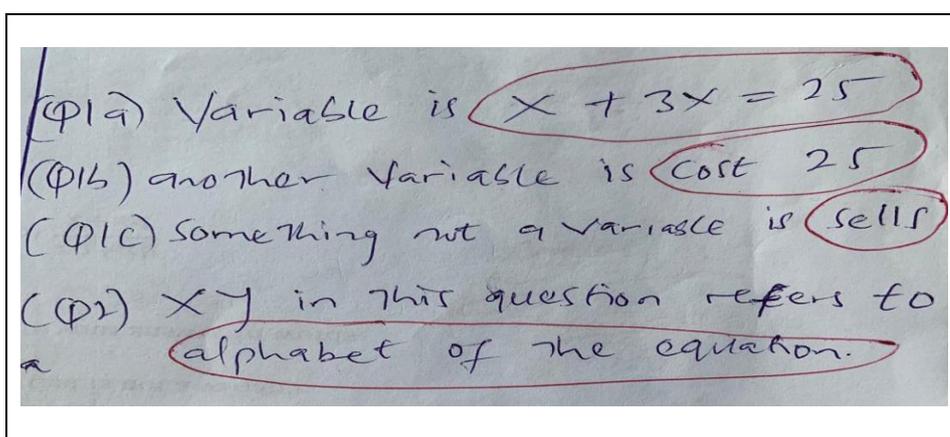


Figure 3: Extract of S₂ question 1 & 2

Figure 3 extracted from S₂ and the transcripts answer was by far contrary to the expected answer. The interview was carried out in order to find out about the S₂ understanding about the variable. The following shows the interview questions and responses with the S₁ and the researcher:

R: What is the Variable as in question 1a ?

S₁: A Variable is $x + 3 = 25$.

R: How do you get this answer ?

S₁: Bello mango is x , Musa mango is $3x$, total mangoes cost 25, therefore $x+3x=25$.

R: Did you ask to name a variable or to form an equation?

S₁: To name a variable, sir.

R: Why did you form the equation?

S₁: Because the equation contains the variable.

R: Okay, name the variable.

S₁: Variable is x.

R: What is the second variable?

S₁: The second variable cost 25.

R: What was your answer to question 2 , What does yz mean in $yz + 3$?

S₁: yz are alphabet.

R: I mean in this question.

S₁: Yes sir, yz are alphabet.

The S₂ answers show that there is a lack of understanding of the concept of algebraic variables by not perceiving the correct interpretation of the variable as the 'number of a thing due to forming a wrong equation as an answer. It was also difficult for S₁ to interpret the product of two variables as two separate variables and viewed it as a letter.

Summary of Major Findings.

The following are the summary of the major findings of the study.

1. The findings indicated that forming of incorrect algebraic equations as variables.
2. Also, the findings revealed that, majority of the students had difficulties for understanding the concept of algebraic variables.
3. The misinterpretation of algebraic variables were identify by many students as a difficulty to perceive the product of two variables as two separate variables.
4. Most of the errors committed by students are not ordinary errors but rather are misconceptions.

Discussion

The findings of this study are discussed based on the four categories of errors related to the understanding of algebraic variables. These included forming of incorrect algebraic equations as variables, lack of understanding the concept of variables, misinterpretation of algebraic variables, and misconceptions due to errors committed by the students rather than the errors per se.

The category of errors that the students form in relation to incorrect equations as variables. These incorrect equations as variables was similarly found as the difficulties in learning algebra (Pramesti & Retnawati, 2019). However, lack

of understanding of basic concepts is a possible reason for this misconception. It is noted in this study that students' responses to the interview questions were contradictory to each other and continuously seemed to be confused and could not provide good explanations.

Likewise, some students had difficulty for understanding the concept of variable when they were asked to name a variable in the problem given. This difficulty for understanding the concept coincided with the errors given in the literature that, the error has a link with levels of cognitive development (Egodawatte, 2011; Tekin-Sitrava, 2017). This means that if a student has slowed mental development, then that students might make more errors and misconceptions than a student who has mental development (Fitria & Susanto, 2023).

More so, misinterpreting the product of two variables was also identified by many students. The students who made such errors had difficulty to perceive the product of two variables as two separate variables combined together by a sign. This is in line with research in which the students misinterpreted algebraic variables, though they sometimes succeeded in determining variable values from algebraic expressions (Fitria & Susanto, 2023). Also, the findings coincide with the study in which students misinterpreted a variable as a label or as a thing or a verb as they failed to perceive the variable as the number of a thing (Ndemo & Ndemo, 2018).

Conclusion

It can be concluded that Students committed a lot of errors in relation to algebraic variables. However, the committed errors by the students are not errors per se, rather a misconception. Hence, Mathematics teachers should be made to seek a possible way of overcoming the identified errors and misconceptions. Also, it could be concluded that understanding students' concept related to the algebraic variable, will provide opportunities for educators to learn students' needs in order to improve their understanding of algebraic variables.

Recommendations

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

1. It is recommended that teachers should involve their students in activities that will aid their learning and algebraic concepts. These will make students to be conscious of the various algebraic concepts and improve to overcome their errors and misconceptions.
2. It is recommended that the curriculum implementers who prepare teachers for pre-service and in-service training should lay emphasis on best teaching method so as for the students to overcome all these errors and misconceptions.

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Effect of iSTEM Approach on Female Students' Attitude towards Mathematics Career Selection among Senior Secondary School Students in Sokoto State, Nigeria

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Abstract

Mathematics plays a crucial role in STEM careers, providing the foundation for problem solving and logical reasoning; yet, female students often exhibit lower participation and motivation in pursuing mathematics related fields. This study examines the impact of the iSTEM approach on female students' attitude toward selecting mathematics as a career in Sokoto State, Nigeria. The research addressed two research questions and tested corresponding hypotheses. The study population comprised 1769 female public senior secondary school students, from which 370 SSII students were selected using a multi-stage sampling technique. Four senior secondary schools were chosen through simple random sampling and intact classes were assigned to both the experimental or control groups purposively. The study employed a quasi-experimental pre-test and post-test design, where the experimental groups received instruction using the iSTEM approach, while the control groups were taught using the conventional approach. Data were collected using a Students Attitude towards Mathematic Career selection Questionnaire (SAMCSQ). The two null hypotheses were tested at a 0.05 alpha level of significance using the Mann-Whitney U test and Wilcoxon. The results indicated significant changes in attitude, demonstrating how the iSTEM experience influenced students' perceptions, beliefs and behaviors (attitude) regarding mathematics careers. Based on the findings, the researchers recommend that curriculum developers integrate the iSTEM approach into mathematics teaching. Teachers should receive training in hands-on, interdisciplinary methods, while targeted programs like mentorship and STEM clubs can help sustain female students' interest in mathematics related careers.

Keywords: Female Students, Attitude, Career Selection, iSTEM approach, and Mathematics

Introduction

Mathematics is necessary at all educational levels from basic through senior secondary to higher institutions, which justify its prominent position in curricula (Smith & White, 2020). It is crucial for national development as well

as scientific and technological advancements promoting diversity and equitable representation in various sectors, particularly in STEM (Science, Technology, Engineering and Mathematics) subject and, has become increasingly important in recent years. Hence exploring female students' perspectives on selecting mathematics as a viable career option is a significant area of focus.

Mathematics is the study of structure, order and relationships which evolved from the basic duties of counting, measuring and describing the shapes of objects. Over time, mathematics has changed its focus to more idealized and abstract concepts. Nevertheless, it requires quantitative computations and logical reasoning (Harper, 2022). Since 17th century, mathematical sciences and technology have greatly advanced through the utilization of this indispensable tool. Being proficient in mathematics is seen as a necessary condition for success in today's culture. In view of this, all levels of education in Nigeria (primary, secondary and tertiary) students are required to take mathematics as a foundational subject (Ogunleye & Akinoso, 2016). Mathematics skills enhance critical thinking, logical reasoning, spatial awareness and concrete problem-solving abilities (Neelakanta, 2019). It is essential skills for decision-making processes.

Attitude is a fundamental aspect of human identity, shaping how individuals perceive, interpret, and respond to the world around them. It influences thoughts, emotions, and behaviors, and plays a critical role in decision-making, interpersonal relationships, and personal development. In view of this, Anthony and Walshaw (2017) indicates that, learning mathematics involves more than just thinking and reasoning but it also depends on how students feel about learning. Also, Han and Carpenter (2018) proposed that attitudes comprise individuals' behavioral, affective and cognitive reactions to the environment, influenced by their emotions or interests. According to Ingram, Holmes, Linsell, Livy, McCormick and Sullivan (2019) stated that sentiments or emotions that a person experiences during the process of learning mathematics make up the component of attitude.

There are extremely few female students in Nigeria studying mathematics, some of the drive factors could be component of attitude which consists of the person's sentiments or emotions associated with learning mathematics (Ajai & Imoko 2015). Thus, Students are motivated to get interested in mathematics to learning and selection of mathematics as area of study or future career.

According to Douglas (2020) Career refers to an individual's journey in the workforce, encompassing the various positions, responsibilities and experiences they undertake over their working years. It entails pursuing individual objectives, growing professionally and gaining knowledge in a particular sector or discipline. A career may entail job shifts, advancements and role changes, influenced by factors such as available opportunities, skills, interests and financial circumstances.

Researchers have extensively studied the determinant factors impacting secondary school student's career decisions (Salami & Oluwaseun, 2013; Eremie & Chiamaka, 2019). Presently, students encounter challenges in selecting a career due to the rapid advancements in technology within the information industry. Initially, female child tends to hold more favorable views towards mathematics compared to boys, but these perceptions tend to become increasingly negative as they progress through school.

Abubakar and Anas (2023) discovered that Sokoto students often exhibit favourable attitude toward mathematics, expressing a liking for and enjoyment of mathematics lessons. Contrary to common belief, these high school students don't generally have a bad opinion on mathematics; instead, they exhibit favourable attitudes towards mathematics. However, while positive attitudes are present, they may not directly correlate with academic execution, as evidenced by the academic standing of the student (Ormrod, 2016). Additional elements like student dedication and effort act as mediators between attitude and achievement; without these factors, positive attitudes alone may not translate into academic success. STEM education, as defined by Bybee (2010), entails an educational framework that interconnects the disciplines of science, technology, engineering and mathematics with practical, application-oriented methods. Broadly speaking, STEM education involves merging these disciplines with real life problems to devise solutions. This educational approach aims to equip students with problem solving abilities, fostering innovation, invention, self-assurance, logical reasoning and technological proficiency. Since gaining independence, Nigeria's approach to teaching students in the fields of science, technology, engineering and mathematics (STEM) has changed. A number of studies, such as those conducted in 2015 by Akase, Mwekaven, Awuhe and Tombuwua, have connected problems with STEM education to the difficulties facing sustainable development in Nigeria. Nigeria has made great strides in STEM in the past, but it still has serious issues that need to be resolved. Studies reveal that STEM education has

resulted in significant progress in areas including telecommunications, agriculture and health.

STEM plays an important role in the development of any nation or economy because it forms the basis for the different emerging technologies that the world's operations are now hinged upon. Hence, the development of girls in STEM cannot be over emphasized because of the roles they play in the society. The truth is that with more girl education in Nigeria, we would have a healthier, more educated, more empowered and more productive nation because the girls of today are the mothers of tomorrow. STEM plays an important role in the development of any nation or economy because it forms the basis for the different emerging technologies that the world's operations are now hinged upon. Hence, the development of girls in STEM cannot be over-emphasized because of the roles they play in the society. Moreover, Akinsowon and Osisanwo (2014) stated that with more girl-education in Nigeria, we would have a healthier, more educated, more empowered and more productive nation because the girls of today are the mothers of tomorrow.

Abubakar and Anas (2023) stated that, despite recognizing the significance of mathematics and aspiring to achieve good grades, many students encountered difficulties in maintaining the level of dedication required for success. This lack of commitment may hinder their prospects in pursuing careers related to mathematics despite their ambitions. Despite the positive achievements of female student in mathematics their overall enrollment and participation in mathematics and mathematics related careers are still limited. The constraints imposed by parental attitudes, societal expectations and a lack of educational and community support continues to restrict the aspiration of many girls who are interested in mathematics (Abdullahi & Salihu, 2022). The limited presence of female mathematics students in Nigeria and selection of the area as career motivated the researcher to investigate female students' attitude towards mathematics career selection by given them intervention through iSTEM approach with hope to improve their motivation towards mathematics career selection in Sokoto state, Nigeria.

Statement of the Problem

The underrepresentation of female students persists in the domains of mathematics, reflecting broader gender disparities in Mathematics education

and careers in many countries. Despite efforts to promote gender equality in education, cultural norms, societal expectations and limited resources continue to hinder female students' engagement and motivation in mathematics.

Many researchers in Nigeria, made efforts to investigate the problems of gender and attitude towards mathematics and career selection. Most of the researchers give emphasis to look into how female students feel about choosing a career in mathematics. In Sokoto State, the number of female students interested in pursuing a career in mathematics remains very low, reflecting a wider issue of gender imbalance in the field. According to data collected from the Ministry of Education, there are 171 mathematics teachers in the public secondary schools in the state, but only 38 of them are female, making up just about 22.2% of the total. This limited number of female mathematics teachers means that many young girls lack visible role models in the subject, which negatively affect their interest, confidence, and motivation to consider mathematics as a career in future.

However, previous studies investigated the perception of female students regarding career selection without given any intervention. Thus, the use of conventional strategy and belief are among common problems in Nigeria and Sokoto State which affect the female students' attitudes towards mathematics and select the area as career.

Looking at this problem at hand, the present study deemed it imperative to conduct research and provide intervention for female students using iSTEM approach, with hope to explore female students' Attitude and motivation towards mathematics carrier selection through iSTEM approach in Sokoto, and hope to bridge the gap to encourage female representation in Mathematics related professions.

Research Objectives

The main objective of this study is to examine the impact of the iSTEM approach on female students' attitudes toward selecting mathematics as a career in Sokoto State, Nigeria. The specific objectives of the study are to:

1. Investigate difference in female students' attitudes toward selecting Mathematics as a career before and after learning Mathematics using the iSTEM approach among Senior Secondary school Students in Sokoto State, Nigeria.

2. Identify the difference in attitudes between female students taught using the iSTEM approach and those taught using the conventional method in selecting Mathematics as a career among Senior Secondary school Students in Sokoto State, Nigeria.

Research Questions

The following research questions guided this study:

1. Is there difference in Female students' Attitude toward selecting mathematics as a career before and after learning Mathematics using iSTEM approach among Senior Secondary school Students in Sokoto State, Nigeria?
2. Is there any difference in Attitudes between Female Students taught using iSTEM approach and those taught using Conventional approach in selecting Mathematics as a career among Senior Secondary School Students in Sokoto State, Nigeria?

Null Hypotheses

Based on the above research questions the following hypothesis were generated and tested:

- H₀₁: There is no significant difference in Female students' Attitude toward selecting Mathematics as a Career before and after learning Mathematic using iSTEM approach among Senior Secondary Schools Students in Sokoto State, Nigeria.
- H₀₂: There is no significant difference in Female students' Attitude taught using iSTEM approach and those taught using Conventional approach in selecting Mathematics as a Career among Senior Secondary Schools Students in Sokoto State, Nigeria

Methodology

In this study Quasi experimental research design was used. The study's population of all 10,769 female students enrolled in Senior Secondary School II (SSII) in Sokoto State. The study population comprised female public senior secondary school students, from which 370 SSII students were selected using a multi-stage sampling technique. Research instrument titled Students Attitude

towards Mathematic Career Selection Questionnaire (SAMCSQ) was validated by two expert , after a pilot study, reliability indexes of 0.85 was established, the instrument was structured in 4 Liker Type Rating scale of “Strongly Agree” (SA)=4, “Agree” (A)=3, “Disagree” (D)=2, “Strongly Disagree” (SD)=1. The data collected was analyzed using descriptive statistic and non-parametric test (Mann Whitney U test and Wilcoxon test) at 0.05 level of significance.

Results

Based on the results obtained from the analyses and interpretations of were done with the use of tables to provide a clear picture of the finding as follows:

Research Question

Is there difference in female students’ attitude toward selecting mathematics as a career before and after learning Mathematics using iSTEM approach among Senior Secondary school Students in Sokoto State, Nigeria? Table 1 shows the median score of pretest and posttest median score of female student’s attitude in selecting mathematics as a career before and after learning Mathematics using iSTEM approach.

Table 1: Pretest and Posttest Median score of Female Students’ Attitude in Selecting Mathematics as a Career before and after learning Mathematics using iSTEM approach

Attitude	N	Median	Standard Deviation	Median Difference
Pretest	182	2.00	1.100	1.00
Posttest	182	3.00	1.109	

The results in table 1 indicate a positive change in attitude among female students, with the median attitude score increasing from 2.00 (pretest) to 3.00 (posttest). This shows that the iSTEM approach had a significant impact on students' attitudes towards selecting mathematics as a career. The median difference between the pretest and posttest scores is 1.00, further including improvement in attitude.

The standard deviation remains relatively consistent, with a slight increase from 1.100 (pretest) to 1.109 (posttest). This indicates that the spread of attitude scores did not change. The findings from Research Question 1 (RQ1) affirmatively, confirming that there is a median difference between female

students' attitudes in selecting mathematics as a career before and after learning mathematics using the iSTEM approach. However, the scores obtained were subjected to test significance using Wilcoxon see Table 2

H0₁: There is no significant difference in Female students' Attitude toward selecting Mathematics as a Career before and after learning Mathematic using iSTEM approach among Senior Secondary Schools Students in Sokoto State, Nigeria. This null hypothesis was tested using Wilcoxon test of attitude in selecting Mathematics as a Career before and after learning Mathematic using iSTEM approach

Table 2: Wilcoxon Test on Female Students' Attitude in Selecting Mathematics as a Career before and after learning Mathematic using iSTEM approach

Attitude	N	Z	P-value	Decision
Pretest / Posttest	182	10947.0	.000	Null H ₀ Rejected

Table 2 indicates a statistically significant difference in the attitudes of female students towards selecting Mathematics as a career before and after learning Mathematics using the iSTEM approach. The p-value is .000, which is less than the significance level. This leads to the rejection of the null hypothesis, suggesting that the iSTEM approach has a significant impact on female students' attitudes.

Research Question: Is there any difference in Attitudes between Female Students taught using iSTEM approach and those taught using Conventional approach in selecting Mathematics as a career among Senior Secondary School Students in Sokoto State, Nigeria? Table 3 shows the median score difference between female students taught using iSTEM and those taught conventional approach.

Table 3: Median Difference between Female Students' Attitude exposed to iSTEM Approach and those exposed Conventional Approach in Selecting Mathematics as a Career

Group	N	Median	Standard Deviation	Median Differences
iSTEM Approach	182	3.0	1.10	1.2
Conventional Approach	188	2.5	1.09	

Table 3 shows that the median and standard deviation of the attitudes of female students taught using the iSTEM approach with those taught using the conventional approach. The median score of the attitudes of female students taught using the iSTEM approach is 3.0 and the standard deviation is 1.10.

While the median score of the attitude of those taught using the conventional approach is 2.5 and their standard deviation is 1.09. The median difference is 1.2. The result shows that there is a median difference between the female students' attitudes taught using the iSTEM approach with those taught using the conventional approach. However, the scores obtained were subjected to Mann-Witney U test (see Table 3) for significance.

Hypothesis

H02: There is no significant difference in Female students' Attitude taught using iSTEM approach and those taught using Conventional approach in selecting Mathematics as a Career among Senior Secondary Schools Students in Sokoto State, Nigeria. This null hypothesis was tested using Mann Whitney test of attitude of students taught using iSTEM and those with conventional approach. The result of the analysis is presented in Table 4.

Table 4: Mann-Witney U-Test on Female students' Attitude taught using iSTEM approach and those taught using conventional approach in selecting Mathematics as a Career

Test	N	Mean rank	Sum of Mean rank	U	P-value	Decision	
iSTEM approach	182	181.08	6337	7.04	.03	Null Rejected	H ₀
Conventional approach	188	169.46	5931				
Total	370						

Table 4 showed significant differences in attitude scores between the iSTEM and conventional approach groups for the overall attitude. The p-values 0.03 indicate significant difference. This indicates that the null hypothesis (H₀₂) is rejected. The iSTEM approach was more effective than the conventional approach in promoting positive attitudes towards selection of mathematics as a future carrier.

Summary of the findings

Based on the analyses of results, the following were the findings of the study:

1. The iSTEM approach significantly increased students' attitude to select a mathematics career. They also became more aware of career opportunities for Mathematics graduates.

2. Students who learned through the iSTEM approach demonstrated significantly more positive attitudes across affective, cognitive, and behavioral domains compared to those taught through conventional method.

Discussion

The results for research question one indicates a positive shift in attitude towards selecting mathematics as a career among female students after learning mathematics using the iSTEM approach. This finding could be related to the Ajzen (2020) which offers insights into how attitudes impact career choices in mathematics. In this context, attitudes towards selection of mathematics as career, perceived behavioral control (the perception of ease or difficulty in pursuing a mathematics related career) and subjective norms (social influences) all significantly influence individuals' intentions to pursue careers in mathematics related fields.

The outcome from research question two suggests there is a difference in attitude between female students taught using the iSTEM approach and those taught using the conventional approach in selecting mathematics as a career. This outcome aligns to the applicability of Lent (2018) to the realm of mathematics on how females' confidence in their mathematical abilities, perceptions of mathematics as a viable career path and exposure to mathematical tasks and role models affect their aspirations in career selection (Wang & Degol, 2017). In this regard enhancing self-efficacy beliefs and showcasing successful female mathematicians can help to motivate more females to pursue careers in mathematics, as suggested.

The results of hypothesis one indicated that iSTEM approach had positive impact on students' attitudes toward pursuing mathematics career with significant improvements. These findings agree to that of Owu-Anne and Assud (2023) who found that there is relationship between the value of mathematics and mathematics achievement also there were positive and significant correlations between the value of mathematics and mathematics achievement. Thus, the significant Impact could be as a result of collaborative and appreciative factors associated with the iSTEM approach. This is in line with the findings of Kelana, Wardan, Firdaus, Altaftazaniand, Rahayu (2020) who found enhanced positive impact on students' affective attitudes toward pursuing mathematics career leading to increased confidence enthusiasm.

The results of hypothesis two demonstrate significant improvements in students' attitudes toward pursuing a mathematics career after the iSTEM intervention. The findings reveal positive changes in all three areas: affective, cognitive, and behavioral attitudes. The results indicate a significant positive change in students' emotional responses toward mathematics after the intervention. These outcome conflict with that of Adetayo and Samuel (2020), the results showed that, there were no appreciable differences in the attitudes toward mathematics held by female students in private and public senior secondary schools, or by male and female students in the same school. The significant positive changes in affective, cognitive, and behavioral attitudes suggest that the iSTEM intervention can help students develop more positive attitudes toward mathematics (Dokme, Arif & Zeynep, 2022). The positive changes in attitudes and behaviors suggest that the iSTEM intervention can potentially increase the number of students pursuing mathematics careers as agreed in the findings of Razali et al., (2020). Impliedly, the findings of this study demonstrate the effectiveness of the iSTEM intervention in improving students' attitudes toward pursuing a mathematics career.

Conclusion

Based on the results under the present study, the researchers concluded that the iSTEM approach significantly improved female students' attitudes toward selecting mathematics as a career. The intervention led to meaningful advancements in students' emotional, cognitive and behavioral engagement with mathematics, fostering a deeper connection to the subject and its career prospects. When compared to conventional teaching methods, the iSTEM approach provide more effective in enhancing students' attitudes toward mathematics.

Recommendations

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

1. Curriculum developers should integrate iSTEM approach into mathematics teaching to enhance relevance and interest in career applications.

2. Mathematics teachers should be trained in hands on, integrated teaching methods to effectively implement iSTEM across mathematics topics.
3. Special programs (e.g., mentorship, career talks, and STEM clubs) should target female students to sustain their interest in mathematics and related careers.

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Effect of Van Hiele Model of Instruction on Student Geometric Thinking and Alleviating Misconception in Solving Geometric Problem among Senior Secondary School Student in Sokoto Metropolis, Nigeria

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Abstract

Geometry, as a fundamental component of mathematics, is essential for developing spatial reasoning, spatial visualization, and problem-solving skills. However, students in Nigeria, like their peers worldwide, often experience persistent challenges and misconceptions in learning geometry. This study investigates the effectiveness of Van Hiele Model of Instruction on Students Geometric Thinking and Alleviating Misconception in Solving Geometric Problem among Senior Secondary School Students in Sokoto Metropolis, Nigeria. A quasi-experimental pre-test post-test design was employed with 377 Senior Secondary II students selected through proportionate sampling, divided into experimental and control groups. Two instruments the Van Hiele Geometric Thinking Level Test (VHGTLT) and a five-tier Students' Geometry Problem Misconception Test (5T-SGPMT) were used for data collection. Descriptive statistics was used to answer the research questions and Mann Whitney U test was used to test the null hypotheses. Findings revealed that students taught with Van Hiele Instructional Model progressed to higher geometric thinking levels and demonstrated stronger conceptual understanding with fewer misconceptions than those taught with conventional approach with differences statistically significant. The study concludes that the Van Hiele instructional model is an effective teaching strategy for developing geometric thinking and correcting misconceptions. It recommends the integration of the Van Hiele model into classroom practices, teacher training programs, and curriculum development to improve geometry learning outcomes.

Keywords: Geometry, Geometric Thinking, Misconception, Van Hiele Instructional Model, Conventional Teaching Approach

Introduction

Geometry is a distinct and fundamental branch of mathematics, concerned with shapes, sizes, spatial relationships, and logical reasoning. Within the mathematics curriculum, it is taught alongside other key areas such as algebra and calculus (Mdyunus & Hock, 2019). Scholars emphasize that understanding geometry requires more than memorization; students need conceptual knowledge to represent mathematical situations in multiple ways and solve problems meaningfully (Luneta, 2015). Despite its importance, geometry instruction in many schools often focuses on traditional teaching, which limits students' ability to grasp concepts deeply (Hassan, 2023; Cho & Win, 2020).

In Nigeria, as in other parts of the world, many students continue to struggle with learning geometry. Studies highlight that only a few achieve proficiency in national assessments, with low performance linked to weak problem-solving skills and misconceptions about basic geometric principles (Aremu et al., 2025; Hassan et al., 2023). Research shows that students taught using traditional approaches frequently fail to meet curriculum objectives, whereas those taught with the Van Hiele model demonstrate significant improvement in understanding and applying geometric concepts (Atebe, 2011; Hassan, 2020). Key problem areas for Nigerian learners include the circle theorem, angles, and geometric proofs, often worsened by teaching methods that overlook students' developmental levels of geometric thinking (Agnes, 2023).

The challenges students face in geometry are multifaceted, involving cognitive, perceptual, and instructional barriers. Many learners perceive geometry as more difficult than other areas of mathematics due to its demand for spatial reasoning, logical deduction, and problem-solving (Adolphus, 2011).

To address these challenges, researchers recommend adopting effective instructional models, such as the Van Hiele theory, which organizes students' progression through distinct levels of geometric thinking. The model supports learners in moving from basic visualization to advanced deductive reasoning through structured instruction.

In my view, adapting the Van Hiele model in Nigerian classrooms is not just a helpful strategy but a necessity. Traditional methods have proven insufficient,

leaving many students with misconceptions and poor performance in geometry (Hassan, 2021). By implementing this approach, teachers can foster deeper learning, enhance students' confidence, and develop transferable problem-solving and reasoning skills. Ultimately, adopting the Van Hiele model can transform how geometry is taught and significantly improve students' geometric thinking skill. (Atebe, 2011; Hassan et al., 2020).

Statement of the Problem

Despite the recognized importance of geometry in various fields such as architecture, engineering, and the sciences, Nigerian students continue to face significant challenges in solving geometry problems. These difficulties are primarily attributed to the traditional, teacher-centered instructional methods that dominate current teaching practices. Research indicates that these conventional methods can lead to weak reasoning skills and hinder the development of higher levels of geometric thinking. Consequently, students exhibit poor geometric understanding, particularly in areas such as circle geometry and plane geometry, as highlighted in WAEC examiners' reports from 2017 to 2023.

Furthermore, many students are found to be at the pre-recognition level of geometric thinking, unable to apply precise reasoning or recognize geometric figures effectively. The prevalent use of conventional teaching strategies has proven ineffective in improving students' geometric thinking skills and understanding. In view of this, the present study used a Van Hiele instructional model and theory to help students, particularly in Sokoto metropolis, in developing their basic understanding of geometry and alleviating their misconceptions and difficulties in learning geometry.

Objectives of the Study

The aim of this study is to identify student's geometric thinking skills and reduce its misconception using Van Hiele instructional model among secondary school students in Sokoto metropolis Nigeria. The specific objectives are to:

1. Investigate the difference between the level of GTS of students taught using van Hiele model of instruction and those taught using conventional approach in the posttest among senior secondary school students in Sokoto metropolis.

2. identify the levels of misconceptions of senior secondary school students in solving geometric problem when taught using Van Hiele model of instructions and those taught using conventional approach in Sokoto metropolis

Research Questions

Base on the above stated objectives, the following research questions will be used to guide the study.

1. What are the levels of GTS of students taught using van hiele model of instruction and those taught using conventional approach in the posttest among senior secondary school students in Sokoto metropolis?
2. What are the levels of misconceptions of senior secondary school students in solving geometric problem when taught using Van Hiele model of instructions and those taught using conventional approach in Sokoto metropolis?

Research Hypotheses

The following null hypotheses were be formulated and tested to guide the study.

- H₀₁:** There is no significant difference between the level of GTS of students taught using Van Hiele model of instructions and those taught using conventional approach among senior secondary school students in Sokoto metropolis.
- H₀₂:** There is no significant difference between the levels of misconceptions of senior secondary school students in solving geometric problems when taught using the Van Hiele model of instruction and those taught using the conventional approach in Sokoto metropolis.

Methodology

The study adopted a quasi-experimental pre-test post-test design with experimental and control groups to assess senior secondary (SS II) students' geometric thinking skills and address misconceptions in Sokoto metropolis.

The population consisted of 16,488 students across 48 schools, from which four schools were randomly selected using proportionate sampling to ensure gender and population representation. A total of 377 students were chosen through Krejcie and Morgan’s (1970) table, with 225 assigned to the experimental group and 152 to the control group. Two instruments were employed: the Van Hiele Geometric Thinking Test (VHGTLT), developed by Usiskin (1982) with 25 multiple-choice items covering five levels of geometric thinking, and the Five-Tier Students’ Geometry Problems Misconceptions Test (5T-SGPMT), adapted from Widodo et al. (2020) to evaluate students’ understanding and reasoning. Both instruments were validated by experts, piloted with 25 students, and showed reliability coefficients of 0.69 (VHGTLT) and 0.83 (SGPMT). Data were analyzed using descriptive statistics for research questions and the Mann-Whitney U test for hypotheses, with tables used to summarize scoring and grading criteria.

Table 1: Criteria for making and grading in van Hiele geometric thinking test

Marks	3 out 5 correct answer criteria	van Hiele Levels
1	1-5	1
2	6-10	2
4	11-15	3
8	16-20	4
16	21-25	5

Table 1: Students can achieve a certain level of thinking if they answer 3 out 5 questions correctly and that one mark is given in level one and two marks are given for answering 3 out 5 questions between 6-10 correctly in level two, to determine the van Hiele’s levels of thinking, the weighted sum score is used as a reference as explained in (Usiskin, 1982). Table 2 provides the weighted sum score.

Table 2: The Weighted sum score for van Hiele levels

Forced van Hiele levels	Weighted Sum Score of VHL								
0	0	2	4	8	16	18	20	24	
1	1	5	9	17	21	25			
2	3	11	19	27					
3	6	7	22	23					
4	13	14	15	29	30				
5			31						
Not fit	10	12	26	28					

Source: (Usiskin, 1982)

Table 2 was developed based on the van Hiele’s theory of geometric thinking, in which the levels are achieved sequentially in order for the students to move

from lower to a higher level of thinking (Hassan,et al., 2023). For example, student who answers at least three or more questions in levels 1 and 3 will be given 1 and 4 marks. Adding up the score we have $1+ 4= 5$ in reference to Table 2 he/she achieved level one of VHL of thinking.

Marking and Grading of 5T-Students Geometry Problems Misconception Test (5T-SGPMT)

The 5T-Students Geometry Problems Misconception Test (5T-SGPMT) uses a five-tier assessment model, where students' responses are evaluated across different tiers, such as correct answers, confidence level, and drawings. The marking and grading process is based on the combination of these answers, leading to different decisions about the students' level of understanding of geometry concepts. The details of the marking, grading and decision are presented in Table 3

Table 3: Marking, grading and decision for SGPMT

S/N	Decision	Description	Marking	Grading
1.	GC (Geometry Conception)	Students provide correct answers at the macroscopic level (the main geometry question) and sub-microscopic levels (Tiers 1-5), are confident in their answers, and their drawings are aligned with geometry problem.	Full marks are awarded. This is the highest level of understanding, reflecting complete mastery of the geometry problem, confidence in their answers, and accurate representation through drawings.	Connected
2.	AGC (Almost Geometry Conception)	Students give correct answers at both the macroscopic and sub-microscopic levels, with high confidence. However, their drawings are either not fully accurate or do not entirely match the geometry problem or explanation	High marks are given but slightly reduced compared to GC due to the issue with the drawings. The student understands the concepts but lacks full alignment between explanation and representation.	Unconnected
3.	LC (Lack of Confidence)	Students provide correct answers at both levels (macroscopic and sub-microscopic), and their drawings are accurate, but they express uncertainty about their answers.	Marks are awarded for correct answers and proper drawings, but there is a deduction due to the lack of confidence. This suggests understanding but hesitancy in applying the concepts.	Connected
4.	LK (Lack of	Students provide answers	Partial marks are	Unconnected

	Knowledge)	that are partly correct at either the macroscopic or sub-microscopic levels, with varying confidence. Their drawings only partially align with geometry problem.	awarded. The answers show some knowledge, but the incomplete or inaccurate drawings and answers suggest gaps in understanding.	
5.	MC (Misconception)	Students may provide either correct or incorrect answers at both levels, but they lack full confidence, and their drawings are not in line with geometry problem.	Marks are deducted due to misconceptions and incorrect or inappropriate drawings. This reflects confusion or misunderstanding of the geometry problems.	Connected
6.	HNC (Have No Conception)	Students give incorrect answers at all levels, have no confidence in their responses, and their drawings are completely unrelated to Geometry concepts	Minimal or no marks are awarded. This decision reflects a lack of understanding and severe misconceptions	Unconnected

Source: (Widodo, et al., 2020)

Results

Based on the result obtained the analysis were done with the use of table to provide a clear picture of the finding as follows.

Research Question One

What are the levels of GTS of students taught using van hiele model of instruction and those taught using conventional approach in the posttest among senior secondary school students in Sokoto metropolis?

Analysis for the Distribution of Students' Van Hiele Levels of Thinking for experimental Group Posttest

The scores obtained at the post-test for the Van Hiele test based on the established criteria were used to analyze the experimental group after the intervention learning geometry using Van Hiele model. Table 4 provides a summary of the students' distributions based on the van Hiele's levels of geometric thinking for experimental group.

Table 4: The Distribution of students' van Hiele's levels of geometric thinking of experimental group in the posttest

van Hiele's levels	Sum of scores	Levels	3 out of 5 Correct Answer	Total (%)
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		Criteria						
		1	2	3	4	5		
0	0							
1	1	*					153	157(69.8%)
	5						4	
2	3	*	*				49	49(21.8%)
3	7	*	*	*			19	19(8.4%)
4	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-
Total							225	100%

Table 4 shows that none of the students failed to achieve level 1 (visualization). However, out of 157 (69.8%) students who achieved level 1 by scoring 1 mark four 4 of them, obtained sum scores of 5 marks for skipping level 2 and were assigned at level 1 based on the van Hiele table. 49 (21.8%) students obtained 3 marks and were assigned level 2. 19 (26.7%) students obtained 7 marks by answering at least three out of five questions in levels 1, 2 and 3 correctly and were assigned level 3 informal deduction.

Analysis for the Distribution of Students' Van Hiele Levels of Thinking of control Group in the Posttest

The analysis of 152 students' distribution based on van Hiele's levels of geometric thinking at the posttest for the control group after intervention involved in learning geometry using conventional approach the summary of the result is provided in Table 5

Table 5: Distribution of students' van Hiele's levels of geometric thinking of control Group in the Posttest

van Hiele's levels	Sum of scores	Levels					3 out of 5 Correct Criteria	Answer	Total (%)
		1	2	3	4	5			
0	0						23	23 (15.1%)	
1	1	*					107	107(70.4%)	
2	3	*	*				22	22(14.5%)	
3	-	-	-	-	-	-	-	-	
4	-	-	-	-	-	-	-	-	
5	-	-	-	-	-	-	-	-	
Total							152	100%	

Table 5: A total of 23 (15.1%) students failed to achieve level 1 at the posttest of van Hiele test of geometric thinking. 107 (70.4%) students achieved visualization level (level 1) where 1 mark was assigned based on van Hiele’s level table. A total of 22 (14.5) also achieved sum scores of 3 and assigned level 2 of van Hiele’s levels.

Summary of Posttest for Students’ Van Hiele Levels of Geometric Thinking for experimental and control group

The analysis provides the characteristics of students’ van Hiele’s levels of geometric thinking in experimental and control groups in the posttest, the summary of the result is provided in Table 9

Table 6: Summary of the Distribution of van Hiele’s levels in the experimental and control groups at the posttest

van Hiele’s level	Distribution for the frequency and percentage of the van Hiele levels	
	Experimental Group	Control Group
0		23 (15.1%)
1	157 (69.8%)	107 (70.4%)
2	49 (21.8%)	22 (14.5%)
3	19 (8.4%)	-
4	-	-
5	-	-
Total	225	152

The results in Table 6 reveal clear differences in students’ distribution across the Van Hiele levels between the experimental and control groups. In the experimental group, most students (69.8%) were at Level 1 (analysis), while 21.8% advanced to Level 2 (informal deduction) and 8.4% reached Level 3 (deduction), with none remaining at Level 0 or progressing to Levels 4 and 5. Conversely, the control group showed 70.4% at Level 1, but a higher proportion (15.1%) at Level 0 and only 14.5% at Level 2, with no students progressing beyond this stage. These findings indicate that the Van Hiele-based instruction enabled broader progression across levels, including advancement to Level 3, while the conventional method limited students to lower levels of geometric thinking.

Null Hypothesis One

H₀₁: There is no significant difference between the level of GTS of students taught using Van Hiele model of instructions and those taught using

conventional approach among senior secondary school students in Sokoto metropolis.

The null hypothesis was tested at 0.05 level of significant.

Table 7: Summary of Mann-Whitney U test Analysis for Experimental and Control Groups

Group	N	Rank	Mean	U	P-value
Experimental (Van Hiele)	225		207.66		
Control (Conventional)	152		161.38	12,902,500	.000

Table 7 presents the analysis of students GTS based on the H_{01} whether if there are significant. The results reveal a statistically significant difference between the two independent groups, with $U = 12,902,500$ and a P-value of 0.000. Since the P-value is less than the 0.05 significance level, the null hypothesis is rejected. This leads to the conclusion that there is a significant difference in the van Hiele levels of geometric thinking skills between the experimental and control groups, in favor of experimental group that taught using Van Hiele model of instructions.

Research Question Two

What are the levels of misconceptions of senior secondary school students in solving geometric problem when taught using Van Hiele model of instructions and those taught using conventional approach in Sokoto metropolis?

Table 8: Students level of Misconception in the experimental Group

S/N	Decisions	Overall conceptual understanding	
		Frequency	%
1	GC (Geometry Conception)	141	62.7%
2	AGC (Almost Geometry Conception)	46	20.4%
3	LC (Lack of Confidence)	18	8%
4	LK (Lack of Knowledge)	6	2.7%
5	MC (Misconception)	9	4%
6	HNC (Have No Conception)	5	2.2%
		225	100%

Table 8 presents the performance of 225 students in a geometry test based on their levels of understanding. The results show that 62.7% (141 students) demonstrated a clear understanding of geometry, while 20.4% (46 students) were categorized as having “Almost Geometry Conception,” reflecting partial

but incomplete knowledge. Smaller proportions of students showed challenges: 8% (18 students) lacked confidence, 2.7% (6 students) lacked knowledge, 4% (9 students) held misconceptions, and 2.2% (5 students) had no conception of geometry at all. Overall, 83.1% of the students either had a strong or nearly strong grasp of geometry, whereas a minority struggled with misconceptions, uncertainty, or lack of knowledge, highlighting the need for additional instructional support.

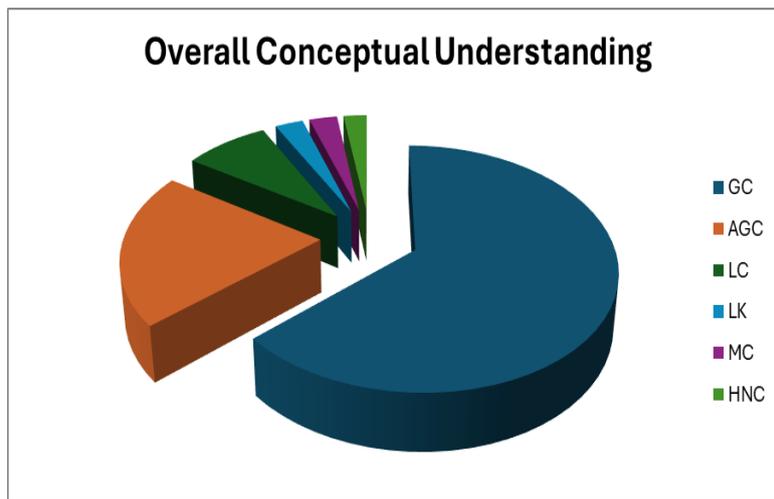


Figure 1: Students level of misconception in the experimental group

Figure 1 illustrates students' performance in geometry by categorizing their levels of understanding. The majority, 62.7%, fell into the Geometry Conception (GC) category, reflecting a strong grasp of geometric concepts, while 20.4% were in the Almost Geometry Conception (AGC) category, showing partial understanding with minor errors. Smaller proportions faced challenges: 8% were in the Lack of Confidence (LC) group, 2.7% in Lack of Knowledge (LK), 4% in Misconceptions (MC), and 2.2% in Have No Conception (HNC). Overall, the chart highlights that most students had a sound or near-sound understanding of geometry, while a smaller portion struggled with uncertainty, limited knowledge, or misconceptions.

Table 9: Students level of Misconception in the control group

S/N	Decisions	Overall conceptual Understanding	
		Frequency	%
1	GC (Geometry Conception)	7	4.6%
2	AGC (Almost Geometry Conception)	9	5.9%
3	LC (Lack of Confidence)	18	11.8%
4	LK (Lack of Knowledge)	24	15.9%
5	MC (Misconception)	35	23%
6	HNC (Have No Conception)	59	38.8%
		152	100.00%

Table 9 highlights the overall conceptual understanding of geometry among students taught with the conventional approach. Out of 152 students, only 4.6% (7 students) demonstrated clear understanding (GC), while 5.9% (9 students) showed partial understanding (AGC). A small group, 11.8% (18 students), lacked confidence (LC), and 15.9% (24 students) had limited knowledge (LK). Larger proportions struggled significantly: 23% (35 students) held misconceptions (MC), and the majority, 38.8% (59 students), had no conception (HNC) of geometry. Overall, 77.5% of these students displayed inadequate understanding, underscoring the limitations of conventional teaching methods and the need for more effective instructional strategies.

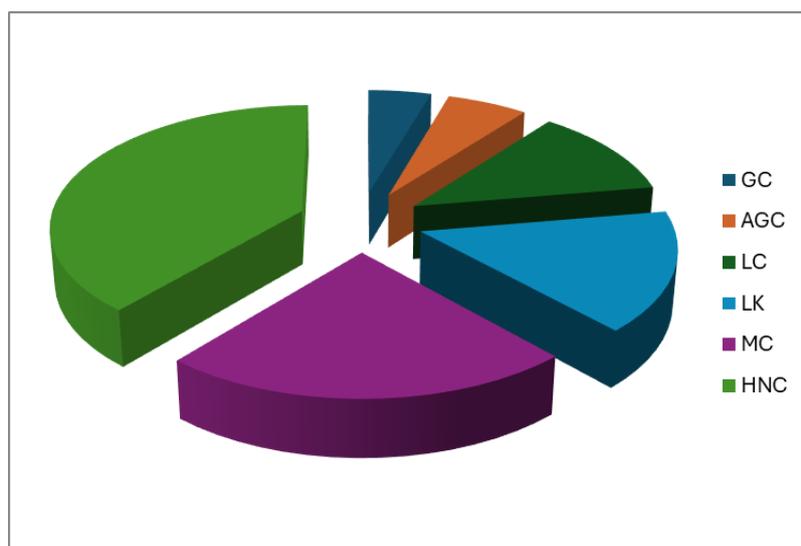


Figure 2: Students level of misconception in the control group

Figure 2 represents the level of conceptual understanding in geometry among students taught using the conventional approach. From the chart, it is clear that the largest portion of students, represented by the orange and teal sections, falls under Have No Conception (HNC) and Misconception (MC), indicating serious gaps in understanding. The orange slice, which is the largest, shows that 38.8% of students had no idea about geometry concepts at all. The teal section, making up 23%, represents students who thought they understood but held incorrect beliefs. The purple and green sections represent Lack of Knowledge (15.9%) and Lack of Confidence (11.8%), showing that many students either didn't know the content or were unsure of their answers. Only a small portion, shown in blue (4.6%) and red (5.9%), reflects students who had clear or partial understanding. This chart highlights that the conventional

teaching method left most students struggling with understanding basic geometry concepts.

Null Hypothesis Two

H₀₂: There is no significant difference between the levels of misconceptions of senior secondary school students in solving geometric problems when taught using the Van Hiele model of instruction and those taught using the conventional approach in Sokoto metropolis.

Man Whitney U test was compared using the data collected from 5T-SGPMT. Result was presented in the table below.

Table 10: Mann–Whitney U Test Summary for Students’ Levels of Misconceptions

Group	N	Mean Rank	U	P-value
Experimental (Van Hiele)	225	126.51		
Control (Conventional)	152	281.50	3040.50	.001

Table 10: Mann–Whitney U test was conducted to statistically compare the levels of misconceptions between two groups. The results indicated a significant difference, $U = 3040.50$, $p < .001$, with the experimental group having a higher mean rank ($M = 281.50$) compared to the control group ($M = 126.51$). This finding shows that the experimental group had significantly lower levels of misconceptions than the control group. The result therefore suggests that the Van Hiele model of instruction was more effective in enhancing students’ conceptual understanding and reducing misconceptions in solving geometric problems compared to the conventional teaching approach.

Summary of the Major Findings

This section presents an overview of the key findings derived from the research questions and hypothesis that guided the study

1. The findings revealed that Students taught with the Van Hiele model progressed to higher levels of geometric thinking, while those taught conventionally remained at lower levels.
2. The findings also revealed that Students taught with the Van Hiele model developed better understanding and had fewer misconceptions, while those taught conventionally showed poor understanding and serious misconceptions.

Discussions of Findings

The findings revealed that Students taught with the Van Hiele model progressed to higher levels of geometric thinking, while those taught conventionally remained at lower levels. This finding aligns with the study Joshi (2017) and Cho & Win (2020) confirmed that the Van Hiele model enhanced student achievement and progression in geometry compared to conventional approaches. These results suggest that the structured phases of learning in the Van Hiele model (visualization, analysis, abstraction, deduction, and rigor) provide a clear developmental pathway that supports students in moving beyond mere visualization to advanced reasoning. In contrast, studies such as Hassan (2015) and Thapa (2017) found that students exposed to traditional instruction often stagnated at the visualization level or below, reflecting the same pattern seen in the control group of the present study.

The findings also revealed that Students taught with the Van Hiele model developed better understanding and had fewer misconceptions, while those taught conventionally showed poor understanding and serious misconceptions. This finding is supported by Arman (2021), who demonstrated that the Van Hiele model was effective in correcting misconceptions in geometry construction, with the experimental group outperforming the control. Additionally, Agnes (2023) found that diagnostic tools reveal widespread misconceptions among junior secondary students, reinforcing the importance of instructional approaches like Van Hiele that actively address and correct misunderstandings. Together, these studies affirm that the Van Hiele model not only improves geometric thinking but also plays a crucial role in reducing persistent misconceptions compared to traditional approaches.

Conclusion

The study conclude that Van Hiele instructional model is the most effective teaching strategy in enhancing geometric thinking and reducing misconceptions in senior secondary school students in Sokoto metropolis, compared to conventional approach. Van Hiele model led to higher thinking level and conceptual understanding.

Recommendation

1. Mathematics teachers should be encouraged to adopt the Van Hiele model and shift from conventional teaching approach to interactive, student-centered learning.
2. Workshops and seminars should be organized by the ministry for Basic and Secondary Education to train teachers' on how to implement the model in mathematics classrooms.
3. Curriculum developers and policymakers should integrate the Van Hiele model into formal education frameworks.

Suggestion for Further Study

The following suggestions are made to guide the future research in related areas.

1. The study focused on plane shapes, it is recommended that other content of geometry like solid geometry, will be investigated using the strategy.
2. The results of this study were derived from senior secondary school students. Further study should be extended to investigate other students in different level of education to provide more generalize findings.
3. Future research should explore more about the misconceptions of students in learning geometry using other approach.

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Assessment of Community Participation in Primary Schools in Northwest zone, Nigeria

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Abstract

This study adopted correlational research design to assess the views of head teachers, teachers and community stakeholders on community participation in primary schools in Northwest zone, Nigeria. The target population of the study was 172,321 primary school teachers across the Northwest zone Nigeria, comprising (Jigawa, Kano, Kaduna, Katsina, Kebbi, Sokoto and Zamfara states) and their community stakeholders which wasn't established due to lack of sampling frame. A multistage sampling technique was used to obtain a sample of 383 primary school teachers and 405 community stakeholders was obtained for the study. Instrument named "Community Participation Questionnaire (CPQ)" was used for data collection. The instrument was validated by experts in measurement and evaluation and educational management. The instrument was used to obtain responses from head teachers, teachers and community stakeholders in the sampled. A reliability index of 0.89 for CPQ was obtained after pilot study and was assumed to reflect the internal reliability of the instrument. Descriptive statistics were used to answer the research questions using mean and standard deviation. The study revealed that, the level of community participation in primary schools in Northwest zone, Nigeria was high. The paper therefore recommends that, state government should build on existing high level of community participation by providing training and support to community members and schools. Also, regular monitoring and evaluation of community participation initiatives should be conducted to ensure their effectiveness and identify areas of improvement.

Keywords: Community Participation, Communication, Resource Mobilization, Community Stakeholders

Introduction

Education shapes the next generation and provides them with the skills and knowledge required for success. Education is universally recognised as the bedrock of national development and a foundational human right. At the heart of this transformative process lies primary education, which provide the foundational knowledge, skills, values necessary for a child subsequent

academic journey and personal growth. According to United Nations Educational Scientific and Cultural Organisation, UNESCO (2014) primary school education provides a foundation for all future learning, and is a vital stage for child's development. It provides the knowledge, skills, and values that the child needs to succeed in life. It is a multifaceted endeavor, extending beyond simple knowledge transmission to encompass the development of critical thinking skills, and values essential for holistic individual and societal growth (Chukuwurah 2013). Primary education serves as the foundational level of education in Nigeria, widely regarded as the most effective instrument for socio-economic transformation, and national development. Despite its acknowledged importance, the Nigerian education sector faces significant and persistent challenges, often described as "deplorable". A major impediment is chronic inadequate funding; for instance, the 7.04% of the national budget allocated to education in 2018 was grossly insufficient when compared to UNESCO's recommended 15-25%.

Community participation in education is widely recognised as crucial factor in enhancing educational outcome and promoting sustainable development (Epstein, 2011). Bakwai (2017) community involvement in education isn't a new concept of a sudden solution to educational challenges. Historically, community have often been central to their children schooling. He noted that until mid-20th century, community held primary responsibility for educating children. While some communities independently run schools today, the broader practice of community participation in education hasn't been fully acknowledged or widely implemented. Community participation helps to fulfil the right to access an education in schools in which attainment and achievement are similar to or higher than others in the context. It also increases the accountability of schools by reducing absenteeism increasing teacher effort and generally seem to contribute to improve student outcomes (Epstien, 2011). However, despite these benefits northern Nigeria struggle with low community participation likely due to the scarcity of community schools, and SBM policy lack clear guidelines on how to implement such engagement there (World Bank, 2014).

The concept of community participation refers to the active involvement of community members in the processes and activities of schools, which can include contributions such as volunteering, resource mobilization, and monitoring (Mapp and Zhang, 2011). Community participation in education is widely recognized as a crucial factor in enhancing educational outcomes and

promoting sustainable development (Epstein, 2010). Community participation in education occurs when a community takes charge of managing its own educational issues. Kanau and Haruna (2013) highlights varying perspectives on citizen or public participation, generally defining it as providing people with more opportunities to effectively engage in development activities. This involves empowering them to utilize their creativity, manage resources, make decisions, and control activities that impact their lives. Similarly, the World Bank (2014) views it as creating opportunities for all community members to actively contribute to and influence their school's development, and to share fairly in its benefits. However, effective community participation goes beyond mere involvement in a school project. Kambuga (2013) emphasize that it's crucial for establishing economic and political relationships within the wider society. It encompasses rural communities organizing their schools, identifying their own educational needs, and sharing in the design, implementation, and evaluation of their school programs.

Community involvement in education isn't a new concept or a sudden solution to educational challenges. Historically, communities have often been central to their children's schooling. For example, Tshabalala in Bakwai, (2017) notes that until the mid-20th century, communities held primary responsibility for educating children. While some communities still independently run schools today, the broader practice of community participation in education hasn't been fully acknowledged or widely implemented. Community participation helps to fulfill the right to access an education in schools in which attainment and achievement are similar to or higher than others in the context. It also increases the accountability of schools by reducing teacher absenteeism, increasing teacher effort and these generally seem to contribute to improved student outcomes (Mapp and Zhang, 2011). As such, participation contributes to communities fulfilling their responsibilities for the education of children and the accountability of schools.

Theoretical Framework

This study was pivoted on System theory. This theory was first proposed under the name of “General System Theory” by biologist Bertalanffy (1968). This theory provides a robust framework for understanding the complex and dynamic interactions between primary schools and their surrounding communities. System Theory posits that an organization or entity, such as a school, is not an isolated unit but rather a complex system comprising

interconnected parts that work together to achieve common goals. It emphasizes the interdependencies among these components and their continuous interaction with the external environment. A core tenet of this theory is that changes in one part of the system can affect other parts, and the system itself is constantly influenced by its external context. This theory views the school and its community not as isolated entities, but as an integrated system where interconnected parts work together to achieve common goals, with changes in one component affecting others and the entire system influenced by its environment. Applying this, the primary school functions as a sub-system interacting with the community as a vital external environment that provides crucial inputs: such as financial contributions for construction and instructional materials, material and infrastructural support through labor and local resources, human resources like volunteer services and specialized teachers, local knowledge for curriculum relevance, and the students themselves, whose enrollment, retention, and attendance are influenced by community engagement. The processes within this system involve the dynamic interactions between the school and community, encompassing communication channels, decision-making mechanisms (like SBMCs), and collaborative activities. These interactions lead to various outputs and outcomes, including improved infrastructure, enhanced student performance, increased accountability, strengthened relationships, and local capacity building.

Statement of the Problem

Despite the widely acknowledged importance of community participation in enhancing the quality and effectiveness of education, primary schools in Northwest zone Nigeria still grappled with a significant deficit in active and meaningful community involvement. This limited engagement is not merely an oversight but is profoundly exacerbated by a complex interplay of pervasive insecurity, entrenched socio-cultural norms, and severe economic constraints specific to the region (UNICEF, 2015; World Bank, 2014). Consequently, the potential benefits of local knowledge resources, and oversight for school improvement remain largely untapped, hindering the provision of quality education by weakening school accountability and oversight, impeding effective resource mobilization (UNICEF, 2021; UBEC, 2015), and ultimately contributing to poor student enrollment, low retention rates, and unsatisfactory educational outcomes. This multifaceted challenge, further complicated by a breakdown in communication and trust between

schools and communities, necessitates a comprehensive assessment to develop effective, context-specific interventions.

Objectives of the Study

The aim of this study was to assess the level of Community Participation in Primary Schools in Northwest zone, Nigeria and specifically the study is set to achieve the following objectives.

1. To determine the level of community participation in communication in primary school in Northwest zone, Nigeria.
2. To determine the level of community participation in resource mobilization in primary school in Northwest zone, Nigeria.

Research Question

The following research questions guided the study

3. What is the level of community participation in communication in primary school in Northwest zone, Nigeria?
4. What is the level of community participation in resource mobilization in primary school in Northwest zone, Nigeria?

Methodology

This study adopted correlational research design to assess the views of head teachers, teachers and their community stakeholders on the level of community participation in primary schools in Northwest zone, Nigeria. The target population of the study is 172,321, primary school teachers their community stakeholders which wasn't established due to lack of sampling frame across the region comprising (Jigawa, Kano, Kaduna, Katsina, Kebbi, Sokoto and Zamfara States). To determine the sample size, the Research Advisor (2006) table was used to obtain 383 primary school teachers, while convenient sampling was used to select 405 community stakeholders. A purposive sampling technique was adopted to select 4 states from the Northwest zone, Nigeria (Jigawa, Kano, Kebbi and Sokoto) due to its minimal security challenge, 45 local government areas was also selected from the 144 local government areas and purposively 3 primary schools were decided for each of the 45 local government areas selected. Convenient sampling was used to select 3 primary schools and 3 community stakeholders (i.e the School Based Management Committee SMBC's) to represent the study. Lastly,

proportionate sampling was used to get appropriately sample size for the study which comprise of (85, 153, 68, 77) for teachers, while (90, 162, 72, 81) community stakeholders for Jigawa, Kano, Kebbi and Sokoto states respectively. Instrument named “Community Participation Questionnaire (CPQ)” was used for data collection. The instrument was validated by experts, in measurement and evaluation and the other from educational management. Cronbach alpha reliability index of 0.89 for CPQ was obtained after pilot study and was assumed to reflect the internal reliability of the instrument. Descriptive statistics were used to answer research questions using mean and standard deviation.

Data Presentation and Analysis

Research Question One: What is the level of community participation in communication in primary schools in Northwest zone, Nigeria?

The research question was analyzed using frequency, mean and standard deviation as presented in table 1.

Table 1: Means and Standard Deviation on the Level of Community Participation in Communication in primary schools in Northwest zone, Nigeria

S/No	Item	Response					Means	SD	Decision
		1	2	3	4	5			
1.	School newsletter writing.	145	85	145	166	125	3.06	1.413	Moderate
2.	Designing school websites.	173	108	108	108	108	2.87	1.428	Moderate
3.	Managing social media handle.	168	120	143	141	94	2.81	1.390	Moderate
4.	Preparing reports card of students.	144	104	152	118	148	3.03	1.445	Moderate
5.	Short message services of the school.	135	103	189	126	113	2.97	1.355	Moderate
6.	Sending emails to school authority.	188	89	171	127	91	2.77	1.396	Moderate
7.	Taking minute of meeting during events.	89	105	164	163	145	3.26	1.321	High
8.	Oral interviews during recruitment exercises.	135	110	137	163	121	3.04	1.396	Moderate
9.	Telephone communication.	77	117	165	150	157	3.29	1.313	High
	Grand Average	139	105	153	140	122	3.01	1.38	Moderate

Source: The researcher’s field survey, 2024

The result in Table 1 indicates the level of community participation in communication in Northwest zone, primary schools, Nigeria, The data revealed that the respondents were of the view that; school newsletter writing

(mean = 3.06 and standard deviation = 1.413), designing school website (mean = 2.87 and standard deviation = 1.428), managing social media handle (mean = 2.81 and standard deviation = 1.390), preparing reports card of students (mean = 3.03 and standard deviation 1.445), Short message service of the school (mean = 2.97 and standard deviation = 1.355), sending emails to school authority (mean = 2.77 and standard deviation = 1.396), taking minute of meeting during events (mean = 3.26 and standard deviation = 1.321), oral interview during recruitment exercise (mean = 3.04 and standard deviation = 1.396), telephone communication (mean = 3.29 and standard deviation = 1.313). Therefore, since the grand average of 3.01, was obtained as moderate. The result is accepted because there is moderate level of community participation in communication in primary schools in Northwest zone, Nigeria.

Research question two: What is the level of community participation in resource mobilization in primary schools in Northwest zone, Nigeria?

The research question was analyzed using mean and standard deviation as presented in Table 2

Table 2: Means and Standard Deviation on the Level of Community Participation in Resource Mobilization in primary schools in Northwest zone, Nigeria

S/No	Item	Response					Mean	SD	Decision
		1	2	3	4	5			
1.	Fundraising of their schools.	46	100	182	183	155	3.45	1.196	High
2.	Provision of furniture to the schools.	31	95	179	254	107	3.47	1.066	High
3.	Construction of access road in the schools	42	136	159	222	107	3.32	1.153	High
4.	Volunteer teaching activities.	62	136	210	158	100	3.15	1.181	High
5.	In-kind contribution to the schools.	62	139	178	155	132	3.23	1.247	High
6.	Providing scholarship for students in the schools.	53	82	247	153	131	3.34	1.159	High
7.	Construction/renovation in the school.	34	89	201	174	168	3.53	1.153	High
8.	Purchasing of books to the school.	46	89	239	180	112	3.33	1.115	High
9.	Provision of improvised materials for teaching and learning activities.	10	151	176	127	106	2.96	1.301	Moderate
	Grand Average	54	113	197	178	124	3.30	1.20	High

Source: The researcher's field survey, 2024

The result in Table 2 indicates the level of community participation in decision making in Northwest zone, primary schools, Nigeria, The data revealed that the respondents were of the view that; Fundraising of their schools (mean = 3.45 and standard deviation = 1.196), Provision of furniture to the schools (mean = 3.47 and standard deviation = 1.066), Construction of access road in the schools (mean = 3.32 and standard deviation = 1.153), Volunteer teaching activities (mean = 3.15 and standard deviation 1.181), In-kind contribution to the schools (mean = 3.23 and standard deviation = 1.247), Providing scholarship for students in the schools (mean = 3.34 and standard deviation = 1.159), Construction/renovation in the school (mean = 3.53 and standard deviation = 1.153), Purchasing of books to the school (mean = 3.33 and standard deviation = 1.115), Provision of improvised materials for teaching and learning activities (mean = 2.96 and standard deviation = 1.301),. Therefore, since the grand average of 3.30, was obtained as high. The result is accepted because there is high level of community participation in communication in primary schools in Northwest zone, Nigeria.

Discussion

In discussing the findings for this study, the researcher has followed the order of the data analyzed using relevant literatures to support the findings and the results.

The results in Table 1 shows that the level of community participation in communication in primary schools in north-west, zone Nigeria, was moderate extent. A moderate level of community participation in communication within primary schools in Northwest zone, Nigeria can be attributed to combination of factors it could be due to formal communication methods like official notice or meetings not reaching all the community members especially those in more remote areas or those who are illiterate. This finding contradicts the finding of Ahmad and Hamdan (2013) who indicated a highly positive correlation between community participation and school-community relation in their 3 variables: parenting, communicating and volunteering. The findings are in consistent with Epstein's theory and previous researches conducted by Nguon (2012); and To (2016), indicating that community members (parent or non-parent) of the students, local authorities and other stakeholders have received updated information from meetings, letters and telephone communication. In terms of communication, it was clear that parents, community members and schools shared school information by different means of communication,

including meetings, written and oral communication tools. School development, community members and parents through meetings and those who attended the meetings disseminated information to the community members who did not attend, so that members of the community could understand the value of education and participated in children's learning. UBEC (2011) advocated that good communication between SBMCs, schools, community, government and other stakeholders ensure active participation in decisions affecting students and promote the partnership between the schools and the wider community.

In addition, a study by Vega-Peronah et al, (2022) also shows that collaborative communication between parents and teachers helps create a greater sense of shared responsibility in supporting students' education. They found that schools that implemented collaborative communication programs had students with better levels of attendance, as well as higher academic achievement compared to schools that were less parental involved. This research supports the idea that structured communication, both through regular meetings and technology, is essential in supporting student academic achievement. Similarly, research by Wang and Li, (2023) found that active parental involvement, especially through ongoing communication with teachers, helps create a more conducive environment for student learning. Their research shows that students whose parents are actively involved in their education have better academic outcomes as well as show more positive social and emotional development.

The result in Table 2 shows that the level of community participation in resource mobilization in primary schools in Northwest, zone, Nigeria, was high. This is due to the fact that community members participated in fundraising, providing of furniture, providing scholarship, purchasing books and provision of improvised materials for teaching and volunteering in teaching activities. The finding this study is in agreement with Cheronno (2023) in his findings that implementing effective policies for school resource mobilization, revisiting the free day secondary school education programme increase enrolment and exploring alternative method like income generating activities for development. The finding also revealed that, stakeholders' involvement plays a big role in resource mobilization and the implementation of free day secondary. In their study Likoko, Barasa and Khaemba (2022) they found that there is a positive and significant relationship between resource mobilization and academic performance of public secondary school.

This finding is in contrast with the study of Kambuga (2013), who found that the nature and extent of community participation for the majority of local communities in cash contribution and labour power contribution was generally limited. He concluded that mobilization of political support was a very important aspect because it made people aware of their participation and the kind of help they were likely to support. The finding of the study recommended that community members should be politically mobilized through education and training on the importance of their development initiatives and to make them feel that the project belongs to them.

The idea was similar to Yusuf (2022), who argues that the involvement of community members in school is particularly useful to mobilize financial, materials and human resources. Community members can also participate in changing the community's attitude toward schooling. School committee members can visit reluctant parents, explain the benefits of education and convince them to enroll their children in school. Similarly, the finding of this study is in line with Bakwai et al (2016), the community participates through a cash donation, labour supply and material supply to finance infrastructure development in basic schools in Nigeria. The study established that the extent to which the community participates in Nigerian schools was very high. Therefore, the high extent of involvement of the community in school activities resulted in the good academic performance of students in secondary schools. Work done by Komba (2017) and Kitoki (2018) has a contrary view in their separate findings which indicated that community members feel reluctant or not interested in participating in school's activities due to a lack of clear accountability, relationships, arrangements and structure to support accountability at various levels.

Conclusion

The study thus concluded that, community participation in primary schools in Northwest zone, Nigeria is high, indicating a strong sense of ownership and commitment among community members. This finding suggests that leveraging community participation can be a viable strategy for improving educational outcomes in the state.

Recommendations

Based on the findings, the following recommendations were made

1. State government should build on existing high level of community participation by providing training and support to community members and schools.
2. school administrators should initiate regular monitoring and evaluation of community participation initiatives should be conducted to ensure their effectiveness and identify areas of improvement.

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Impact of Inductive Approach on Academic Performance in Algebra among Senior Secondary School Students in Gusau Metropolis, Zamfara State, Nigeria

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Abstract

This study assesses the impact of inductive approach on students' academic performance in Gusau Metropolis, Zamfara State, Nigeria. The study was guided by two research questions, each with its corresponding null hypothesis. The study employed a quasi-experimental design entailing pre-test and post-test. The population of the study comprised all senior secondary school students (SSII) in Gusau Metropolis. There are four thousand eight hundred and sixty-six (4866) students in the population, where three thousand three hundred and eighty-nine (3389) were male and one thousand four hundred and seventy-seven (1477) were female. Two schools were selected using simple random sampling techniques through a ballot method out of twenty-six (26) schools in Gusau metropolis. The schools were randomly assigned to experimental and control groups. Algebra Performance Test (APT) was the instrument used for data collection. The instrument was validated by five experts, including three experienced secondary school Mathematics teachers. The pilot test was conducted in a school that is out of the sample but part of the population. The result of the pilot test was used to obtain a reliability index of 0.83. The experimental group was taught Algebra using inductive approach while the control group was taught using conventional method. The APT was administered to both groups before and after the treatment. The stated research questions were answered using descriptive statistics, while the null hypotheses were analyzed using independent sample t-test at 0.05 level of statistical significance. The findings indicate that when students were taught Algebra using inductive approach, they performed better than when they were exposed to conventional method. Also, male students performed better than their female counterparts when taught Algebra using inductive approach. In light of these findings, the researcher recommends that teachers be taught how to utilize the inductive approach through a series of seminars and workshops.

Keywords: Algebra, Academic Performance, Inductive Approach

Introduction

Mathematics plays a significant role in the life of an individual, ranging from health, income, satisfaction with life, employability, and well-being (Abín, et al., 2020). Mathematics is concerned with nature and everyday problems; it also involves imagination, intuition, and reasoning to find solutions to human unending problems (Ali Khan, 2015). Mathematics started based on inductive reasoning through man's experience with nature, and trying to explore nature and make his life more comfortable and enjoyable (Ali Khan, 2015). The application of inductive reasoning, even in our daily lives, cannot be overemphasized. Whether one is aware or unaware, inductive reasoning is employed to make a decision and draw a conclusion from previous experience. Therefore, the inductive approach is the basic approach of exploring the concepts of Mathematics and applies to many educational levels of the learners (Ebrahim, 2010).

Algebra is a branch of Mathematics that deals with abstract concepts. The real-life problems are transferred to algebraic expressions or equations. Algebra is not just an aggregation of letters and symbols with no meaning or value, but it represents a certain variable in the real world (Odumosu & Areelu, 2018). Many people find it difficult to use basic operations in Mathematics, talk less of representing or expressing that operation in the form of a relationship between two or more variables (Wee, et al., 2021). Some of the research indicated very poor performance of students in Algebra, and this concept plays a significant role in the advanced study of Mathematics (Matthews & Farmer, 2008) The performance of students in Algebra can be improved through the use of student-centered teaching methods, such as concept mapping and inductive approach (Adisa & Abiola, 2021). Students who were taught Algebra using concept mapping performed significantly higher than those taught using the conventional method (Adisa & Abiola, 2021). Secondary school teachers always search for good and reliable strategies in teaching Algebra, such strategies should be student-centered strategies (Obafemi & Ahumaraeze, 2025)

Students' academic performance has become a lingering issue in Mathematics. Teachers and all concerned educational stakeholders are working tirelessly to remedy the situation. Many alternatives were tested, ranging from teachers'

factors, students' factors, school factors, administrative challenges, to poor teaching strategies (Odumosu & Areelu, 2018; Sosa-Moguel & Aparicio-Landa, 2021). The academic performance of students was measured in both internal and external examinations, but the results show a very poor performance of students in Mathematics. Many students find Mathematics difficult; this difficulty is not attached to the content of Mathematics or the teachers, but rather the strategies employed by the mathematics teachers (Islam & Rafi, 2020).

The inductive teaching approach is a teaching method that requires evidence gathering, critical thinking, by providing a sufficient number of examples, and drawing a formula or generalization from the specific examples (Adams et al., 2021). The inductive approach starts from several particular cases and generalizes, from concrete to abstract, from known to unknown, and from simple to complex (Adams et al., 2021; Islam & Rafi, 2020). The inductive method of teaching is based on induction. Induction means to offer a general truth by showing that if it is true for a particular case, it is true for all cases. The inductive method in the world of mathematics is a method of constructing a formula with the help of a sufficient number of concrete, actual, and real examples (Sosa-Moguel & Aparicio-Landa, 2021). An inductive approach is used by Mathematics teachers to develop formulas and rules. The inductive approach requires the teacher to give sufficient examples before generalizing. The teacher has to make sure that the rules are followed. See example below

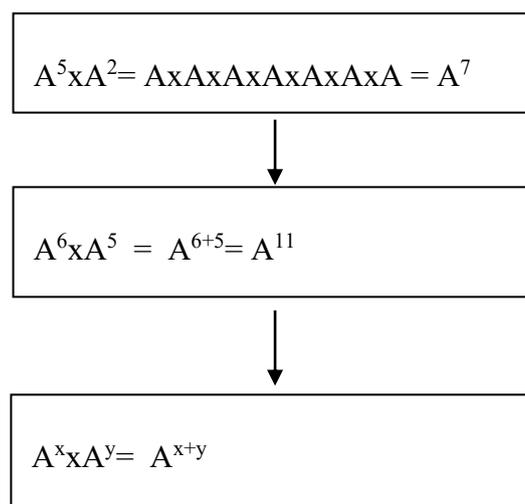


Figure 1: Examples of Inductive Approach in Indices
Source: Developed by the researcher

In Figure 1 above, the teacher has to provide sufficient examples of evaluating indices by counting the number of times a particular variable appears. The next step is to provide a sufficient number of examples by adding the power of variables to get the results. Then, here comes the generalization for any arbitrary number. Whenever two indices are multiplied together, we add their powers Generally inductive approach takes the following steps

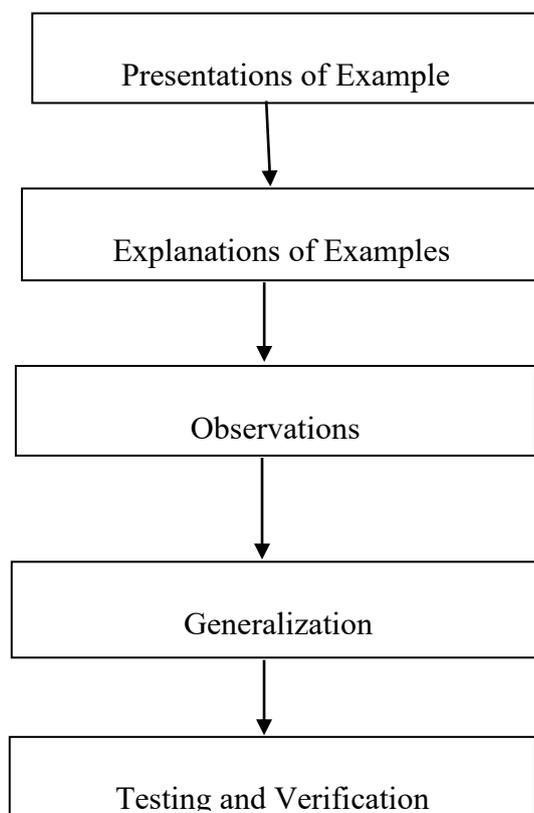


Figure 2: Steps in Inductive Approach
Source: Islam and Rafi (2020)

The inductive approach was found to be beneficial in improving students' academic performance. Inductive approach was found to enhance students' reasoning ability in Mathematics and in Algebra in particular, compared to a conventional teaching method (Sosa-Moguel & Aparicio-Landa, 2021). Furthermore, according to Taa, (2022), Students taught Mathematics using inductive approach performed better than those taught using conventional method. So, also the higher ability students performed better than the lower and average ability students when exposed to inductive approach. The research shows no significant difference in the performance of males and

females exposed to inductive teaching approach. The use of problem-based learning method has a significant influence on students' academic achievement in Algebra compared to the conventional method (Donatus James, 2023). Similarly, the researcher found no significant difference in gender when taught Algebra using problem-based learning strategy. According to the findings of Akinoso (2019), inductive teaching strategy influences students' academic performance than the conventional teaching method, but has no effect on gender. Both male and female students can perform equally well when taught Mathematics using inductive approach. Furthermore, research has shown that inductive method helps to improve the first three components of the cognitive domain in Algebra (Islam & Rafi, 2020). This research also indicates no significant influence of inductive approach on gender. Kaur, (2019), in trying to find out the effectiveness of inductive and deductive methods in Mathematics. His findings indicate a significant difference in the achievement score of students taught Mathematics using inductive approach and those taught using conventional method, but found no significant difference between deductive and inductive methods. Inductive teaching method is not only applied in Mathematics but also in other subjects. Inductive approach has proven significant influence on the performance of students in basic science (Adams et al., 2021).

Statement of the Problem

The achievement of mastery in higher education in Algebra and Mathematics in general relies on a solid foundation laid at the primary and secondary schools. If the foundation is too weak, higher education may not meet the required needs of the nation. Thus, Mathematics teaching and learning in both primary and secondary schools across Nigeria leave much to be desired, as evidenced by the poor performance of students in both internal and external Mathematics examinations. The poor performances of students in Mathematics at the secondary level pose a serious concern to the educational system in Nigeria. In the years 2005 to 2008, the Senior Secondary Certificate Examination (SSCE) Mathematics paper was cancelled throughout due to leakages of question papers. One could notice that the marking of Senior Secondary Certificate Examination (SSCE) is enough to get any concerned person sad about students' Performance in Mathematics in our schools today. Some candidates submitted blank scripts, many recopied the questions, and a good number of those who attempted to answer the questions ended up scoring below pass marks. In centers where reasonable degrees of success were

recorded, hallmarks of cheating, such as centers committing the same right and wrong, were observed.

In Zamfara state, the Ministry of Education in 2022 reported that the results of the West African

Examination Council (WAEC) out of twenty-five thousand and forty (25,040) candidates who sat for the examination, only five thousand and eight (5008) candidates, representing 20%, managed to obtain five credits including Mathematics. When the National Examination Council (NECO) of the same year was released, six thousand five hundred and fifty-three (6,553) candidates representing 25% out of twenty-six thousand two hundred and twelve (26,212) candidates representing 75% failed to get five credits, including Mathematics. By the above reasons, it has clearly showed that the massive failure of students in mathematics is a result of poor teaching methods adopted by mathematics teachers in various secondary schools.

The above captures the general performance of students in Mathematics. In particular, Algebra is among the most difficult concepts in Mathematics. This may not be unconnected with the use of symbols and letters to represent quantity or a variable. The hatred and poor performance of students in Algebra can be seen in the WAEC Chief examiners' reports of 2019, 2020, and 2021. For the consecutive three years, students failed to attempt questions in Algebra, and even those who attempted were wrong. This poor performance and hatred of Algebra may not be unconnected with the poor teaching methods employed by secondary school teachers. It is one of the suggestions for the remedy of this ugly situation; the Chief Examiner recommended the use of some learner-centered teaching method. This can be achieved through the use of inductive approach. As such, the researcher used Inductive approach of teaching to investigate the performance of students in Algebra in senior secondary schools in Gusau metropolis.

Objective of the Study

The main objective of this study is to investigate the effect of the inductive method in Algebra on the performance of senior secondary school students in Gusau, Zamfara state. Specifically, the study was carried out to;

1. Investigate the impact of the Inductive method in enhancing students' performance in Algebra in Gusau Metropolis.

2. Determine the performance of male and female students taught Algebra using inductive approach in Gusau Metropolis.

Research Questions

1. What is the difference between the mean academic performance of students taught Algebra using inductive approach and those taught using conventional method in Gusau metropolis?
2. Is there any significant difference between the mean academic performance of male and female students taught Algebra using inductive approach in Gusau metropolis?

Null Hypothesis

Based on the research questions, the following null hypotheses were formulated and tested at $P \leq 0.05$ level of statistical significance

H₀₁: There is no significant difference between the mean academic performance of students taught Algebra using inductive approach and those taught using conventional method in Gusau metropolis.

H₀₂: There is no significant difference between the mean academic performance of male and female students taught Algebra using inductive approach in Gusau metropolis

Methodology

The research was conducted in Gusau Metropolis, Zamfara State, Nigeria. The study employed a quasi-experimental design entailing pre-test and post-test. The design involves Control Group (CG) and Experimental Group (EG). The control group was taught Algebra using the conventional method, while the experimental group was taught Algebra using inductive approach. The treatment lasted for four weeks. The population of the study includes all senior secondary school students in Gusau Metropolis. The total number of students in Gusau metropolis is four thousand eight hundred and sixty-six (4866). The population includes three thousand three hundred and eighty-nine (3389) males and one thousand four hundred and seventy-seven (1477) female students. Since the study employed a quasi-experimental design, which accommodates non-random assignment, the study used intact classes. Therefore, two schools were chosen using simple random sampling techniques through a balloting method out of twenty-six schools in Gusau metropolis. The

two schools chosen were assigned as the control and experimental groups. In the control group, there are seventy (70) males and 37 females. In the experimental group, there are fifty-five (55) males and thirty-five (35) females. The instrument used in this research is the Algebra Performance Test (APT). The instrument consists of forty (40) multiple-choice questions. Each questions carry one mark. The instrument was validated by five experts. Three out of five were experienced secondary school Mathematics teachers. One is a senior lecturer from the Department of Science Education, Ahmadu Bello University, Zaria. The fifth is also a senior lecturer from the Department of Counselling Psychology, Ahmadu Bello University, Zaria. The pilot study was conducted in one of the schools in Gusau Metropolis. The school is not part of the sample but is contained in the population of the study. The pilot test was split into two halves and was analyzed using Pearson Product-Moment Correlation. The reliability index was found to be 0.83. The study took seven (7) weeks to complete and was conducted by the researchers physically. The instrument was administered before and after the intervention. The pre-test results show that the two groups were homogeneous. The descriptive statistics were used to answer the research questions. The independent sample t-test was used to analyze the null hypotheses at 0.05 level of statistical significance.

Results

The results of two stated research questions and null hypotheses are presented in tables and figures below.

Research Question One: What is the difference between mean academic performance of students taught Algebra using inductive approach and those taught using conventional method?

Table 1: Students' Performance in Experimental and Control Groups

Group	N	Mean	Std Dev.
Experimental	90	32.18	5.35
Control	107	21.16	5.25

Source: Field data

Table 1 above shows that the experimental group gained a mean academic performance of 32.18 with a standard deviation of 5.35. The control group gained a mean academic performance of 21.16 with a standard deviation of 5.25. Therefore, the experimental group performed better than the control group. This gain in the mean performance score of experimental groups may not be unconnected with the intervention.

Research Question Two: Is there any significant difference between mean academic performance score of male and female students taught Algebra using inductive approach?

Table 2: Male and Female Performance in the Experimental Group

Gender	N	Mean	Std Dev.
Male	55	25.38	7.28
Female	35	21.16	5.98

Source: Field data

Table 2 indicates that male students gain a mean academic performance of 25.38 with a standard deviation of 7.28. The female students got a mean academic performance of 21.16 with a standard deviation of 5.98. Male students performed better than their female counterparts. Therefore, the inductive approach favors male than female students.

HO₁: There is no significant difference between the mean performance score of students taught Algebra using inductive approach and those taught using conventional method.

Table 3: Independent Sample t-test Results of Experimental and Control Groups

Group	N	Mean	Std. Dev.	P-value	Decision criterion
Experimental	90	32.18	5.35	0.001	Rejected
Control	107	21.16	5.25		

Decision Criterion: Reject Ho if $P \leq 0.005$

Source: Field data

Table 3 presents the results of experimental and control groups. Since the P-value is 0.001 less than 0.005, the stated null hypothesis must be rejected. Therefore, there's a significant difference in the mean performance score of students taught Algebra using inductive approach and those taught using conventional method. This difference can also be seen in their mean performance score.

HO₂: There is no significant difference between the mean performance score of male and female students taught Algebra using Inductive approach.

Table 4: Independent Sample t-test of Male and Female in Experimental Group

Gender	N	Mean	Std. Dev.	P-value	Decision criterion
Male	55	25.38	7.28	0.001	Rejected
Female	35	21.16	5.98		

Source: Field data

Table 4 above indicates the mean performance score of males as 25.38 with a standard deviation of 7.28. Female students have a mean performance score of 21.16 with a standard deviation of 5.98. The stated null hypothesis was rejected. This confirms that there's a significant difference in the mean performance score of males and females taught Algebra using inductive approach.

Discussion

The findings of this research indicate that students who were taught Algebra using an inductive approach performed better than students who were taught Algebra using the conventional method. This finding was supported by (Adams et al., 2021; Akinoso, 2019; Donatus James, 2023; Islam & Rafi, 2020; Kaur, 2019). All their findings show that students taught Algebra and other Mathematics concepts using an inductive approach performed better than students exposed to the conventional method.

Our findings with regard to gender indicate that male students performed better than their female counterparts. This finding is supported by Taa (2022). Male students performed better than female students when taught Algebra using inductive approach. Nevertheless, the findings of this research with regard to gender were against the findings of (Donatus James, 2023; Islam & Rafi, 2020; Kaur, 2019). In their findings, they found that inductive approach is gender-friendly.

Conclusion

In conclusion, the inductive approach is a very good teaching method in teaching and learning Mathematics. The approach has proven to have immense benefits when it is employed. Many research has shown that inductive approach is far better than the conventional method. But there is a controversial finding with regard to the impact of inductive approach to gender. Some research findings indicate that both male and female students can perform equally well. While some indicate that male students performed better than their female counterparts.

Recommendations

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

1. Mathematics teachers should be trained in the effective use of inductive teaching strategy through a series of workshops and seminars.
2. Students should be engaged through inductive approach to discover general rules or formulas by themselves.
3. Curriculum planners should recommend the use of inductive approach in developing Mathematics curriculum for some concepts in Mathematics where it is more appropriate to use the strategy.

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Functionality of Security Service as Correlate of Lecturers' Job Performance in State Universities, North Central Zone, Nigeria

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Abstract

This study examined functionality of security service as correlates of lecturers' job performance in state universities, North Central, Nigeria. Three objectives and three research questions with one null hypothesis were formulated to guide the study. The descriptive survey of the correlation type research design was employed. The population of the study was 3239 lecturers. A sample size of 346 was obtained based on Research Advisors Table (2006). Two instruments were used for collection of data for the study titled: Functionality of Security Service Questionnaire (FSSQ) and Lecturers' Job Performance Questionnaire (LJPQ). Face and content validity were obtained after thorough screening, corrections were made and irrelevant items were removed by the experts in Educational Foundations, Faculty of Education and Extension Services, Usmanu Danfodiyo University, Sokoto. Reliability indices of 0.73, and 0.82 were obtained respectively after trial testing and analysis of the trial testing using Cronbach's alpha. Data were collected and analyzed using mean, standard deviation as well as PPMC via the Statistical Package for Social Sciences (SPSS) 23.0 version. The findings revealed that there was moderate level of functionality of security service in States Universities, North-Central, Nigeria and high level of lecturers' job performance in state universities, North Central Zone, Nigeria. There was also a low positive significant correlation between functionality of security service and lecturer's job performance in state universities, North Central, Nigeria. The study recommended among others that the universities management should ensure that essential social services are made readily available and accessible to all lecturers and to be functional, efficient and responsive to lecturers' needs in state universities, North Central, Nigeria. The study concluded that, there was low positive significant relationship between functionality of security services and lecturers' job performance in state universities, North Central, Nigeria.

Keywords: School Security Services, Job Performance, Lectures, State Universities, North-Central Nigeria

Introduction

The security system in the institutions (in recent time) had become so porous that lives and properties appeared not to be saved. Cases of theft, burglaries, abduction, attack, vandalism, cultism, rape and so on became everyday' report in these institutions. People live in fear in these institutions. There are security reports about abducted or kidnapped lecturers. There are also stories about members of dreaded cults threatening the lives of dedicated lecturers and members of their families. The orthodox security agents (like the Army, Police and others) appeared to have become overstretched with armed robberies, kidnapping and other national security challenges in the larger society. These have thus prevented them from focusing on educational institutions. In recent times, the police seem to be busy running after criminals (armed robbers, political thugs, ritualists, and so on) in the location of these universities. Perhaps, this could have diverted police attention from the security in the Universities. Poor security services could cause distractions that are negatively affecting lecturers' job performance in North Central state Universities.

Without gainsaying, education system needs security for optimal performance (Aminu, 2019). The global mandate which seeks to protect the security of life and properties in tertiary institutions permits variety of conceptual descriptions of security based on relative understandings of what entails a threat, its intensity, cause and effects, and the possible means for prevention or removal (Ejukonemu & Imam, 2021).

The concept of security could be seen as the preventive measures that can enhance a social climate, such as conflict resolution programmes, zero tolerance policies, bullying prevention programmes and policies (Ukala & Nwabueze, 2016). Lecturers' job performance on the other hand is essential because it plays a significant role in the development of the Nigerian educational system (Yusuf & Ogbudinkpa, 2017), the realisation of "Education for all" goals, and the accomplishment of socio-economic growth of Nigeria. It connotes the behaviours and actions of lecturers that contribute positively to the overall job performance. Behaviours of an individual (employee) who contributes to the organizational goal accomplishment constitute what is called job performance. This indicated that job performance

is the expected value of what people do in organizations which is relevant toward enhancing organizational effectiveness.

Job performance also refers to the ability of employees to carry out responsibility, at a given time by using the appropriate procedure and available resources. It therefore shows that for lecturers to perform their assigned responsibilities as expected, some support services need to be made available and functional. Lecturers play a central role in the academic ecosystem of universities, serving as educators, mentors, and researchers. Owolabi and Aramide (2017) posited that the quality of their teaching, research output, and overall job performance is influenced by a multitude of factors, including institutional support, professional development opportunities, workload management, and work-life balance. Researchers (Adeleke & Olaitan, 2018; Babalola, 2017; Onukwugha & Agoha, 2020) indicated that access to adequate support services, including social and psychological support, can significantly influence lecturers' job satisfaction, well-being, and ultimately, their effectiveness in fulfilling their roles within the university.

Two-Factors Theory

Frederick Herzberg, a prominent proponent of the Two-Factors Theory, focuses on understanding the factors that influence job satisfaction and motivation in the workplace. The theory posits that there are two distinct sets of factors influencing job satisfaction and motivation: motivators (satisfiers) and hygiene (dissatisfies), which are related to the work environment. The presence of motivators leads to job satisfaction and motivation, while their absence does not cause dissatisfaction.

Intrinsic and extrinsic factors are also considered in the theory. Motivators are intrinsic to the job and related to personal growth and fulfillment, while hygiene factors are extrinsic and relate to the work environment and conditions. To increase job satisfaction and motivation, the job should be enriched by adding more motivators, providing more opportunities for achievement, recognition, responsibility, and personal growth.

However, improving hygiene factors can lead to job dissatisfaction, but it does not necessarily increase motivation or satisfaction. Therefore, it is essential to enhance motivators to increase job satisfaction and motivation.

The relevance of the theory to the present study is that institutions or management should focus on improving both hygiene factors to prevent dissatisfaction and motivators to enhance satisfaction and motivation. An environment with motivating factors, such as security services, can lead to efficiency, effectiveness, and significant success for both the organization and individuals.

Adebayo, Ojo and Mohammed (2018) conducted a study on security provisions and lecturers' productivity in Nigerian universities using a descriptive survey method. The survey involved 420 lecturers from twelve universities across six geopolitical zones. The instrument was a self-constructed questionnaire called the "Security Provisions and Lecturers' Productivity Questionnaire" (SPLPQ). The instrument was validated by experts in Educational Management and Security Studies, obtaining a reliability coefficient of 0.82 for security provisions and 0.79 for lecturers' productivity. The results showed a significant positive relationship between security provisions and lecturers' productivity. The study recommended upgrading security infrastructure and regular staff training. The findings are related to the current study, which focuses on North Central Nigeria, as both examine the impact of security services on lecturers' performance.

Chukwuemeka and Nwankwo (2020) examined the impact of campus safety concerns on academic staff in South-East Nigerian universities using a comparative descriptive survey method. The survey involved 380 lecturers from seven universities, representing 45% of the population. The questionnaire, "Campus Security Assessment Index," had reliability coefficients of 0.84 for campus safety and 0.81 for work performance. The findings revealed significant security concerns, with female lecturers being more affected. The study recommends gender-sensitive security measures and panic buttons in academic buildings.

Adams (2021) investigated the relationship between security management cultures and lecturers' academic service delivery in tertiary institutions in Akwa Ibom State, Nigeria. A correlational survey research design was used, with 1,017 (15%) of 6,782 lecturers participating. The study used the Security Management Cultures and Lecturers' Academic Service Delivery Questionnaire (SMCLASDQ) instrument, validated by experts in Measurement and Evaluation and Educational Management. The results showed that information and physical security cultures significantly influenced

lecturers' academic service delivery. The study recommends school management and government to improve security management cultures to curb cult-related activities, kidnapping, drug abuse, room break-ins, theft, pilfering, and sexual assaults. The findings are related to the current study, which also focuses on school security services in different locations.

Anho (2022) conducted in Delta State colleges of education, Nigeria, to examine the relationship between school workplace safety and security challenges and lecturers' job performance. The research involved 1257 lecturers from three colleges, with 640 being sampled. A self-constructed questionnaire was used, with a reliability coefficient of 0.86 for safety and 0.80 for job performance. The questionnaire was validated using the split half technique and Pearson Product Moment Co-relational statistics. The study found a significant relationship between these challenges and lecturers' job performance. The study also suggested that innovative management options could help address these challenges. The findings were analyzed using Likert four-point rating scales. The study is related to the current study, which focuses on security services in different locations. The findings suggest that implementing these innovative management options could be a solution to these challenges.

Statement of the Problem

Universities as tertiary institutions are the highest level of schooling in the Nigerian education system. Therefore, universities should have highly functional security service. This security services is no doubt essential for the proper functioning of the university as an institution of learning. The security service is so vital to the extent that scholars such as Agba and Ocheni (2017) described it as essential driving force for socio-economic and technological transformation of any nation. Therefore, the adequacy and functionality of security service is expected to enhance high job performance among lecturers in Nigerian universities.

It is however pathetic to note that security services in state universities, North-Central, Nigeria, is in deplorable conditions. For instance, the researcher observed that in states universities, North Central, Nigeria, the functionality of security services is very poor in the sense that in some Universities such as Usmanu Danfodiyo University, Sokoto, the security services are very low where one security man is attached to a whole faculty.

However, it is astonishing to note that, there is dearth of empirical research examining the functionality of school security services on lecturers' job performance specifically within the context of state universities in Nigeria. Hence, to the best understanding of the researcher, little had been done as regards to the extent to which the functionality of security services relates with lecturers' job performance in state universities, North-Central, Nigeria. Thus, the current study is intended to examine the functionality of security services as it relates to lecturers' job performance in terms of teaching, research, publications and community services in state universities, North-Central, Nigeria.

Objectives of the Study

The aim of this study was to investigate the relationship between functionality of security services as correlate of lecturers' job performance in state universities, North-Central, Nigeria. The objectives of the study include;

1. To examine the functionality of security service in States Universities, North-Central, Nigeria.
2. Find out the level of lecturers' job performance in States Universities, North-Central, Nigeria.
3. To investigate the relationship between functionality of security service and lecturers' job performance in States Universities, North-Central, Nigeria.

Research Questions

The following research questions were raised to guide the study:

1. What is the level of functionality of security service in States Universities, North-Central, Nigeria?
2. What is the level of lecturers' job performance in States Universities, North-Central, Nigeria?
3. What is the relationship between functionality of security service and lecturers' job performance in States Universities, North-Central, Nigeria?

Research Hypothesis

H₀₁: There is no significant relationship between functionality of security service and lecturers' job performance in States Universities, North-Central, Nigeria.

METHODOLOGY

This study adopted the descriptive survey of the correlational type research design, since this study focuses on security service functionality as correlate of lecturers' job performance. According to Amajuoyi and Joseph (2016) this type of design involves investigating the relationship that exists between dependent and independent variables.

This study surveyed lecturers from six state universities in North-Central, Nigeria. Purposive sampling was used to select four universities, as the remaining two were used for instrument testing. A sample size of 346 respondents was obtained from population of 3239 lecturers using Research Advisor (2006). The researcher used stratified and proportionate sampling for lecturers due to the heterogeneous nature of the lecturers. Simple random sampling was also used to ensure equal participation, as per Otaha (2015) assertion that random sampling ensures every subject in the population has an equal chance of being selected.

Table 1: Sample of the Study

State	Universities	Population Lecturers	Sample Lecturers
Kwara	Kwara State University, Malete	1078	115
Kogi	Prince Abubakar Audu University, Anyigba	697	75
Nasarawa	Nasarawa State University, Keffi	912	97
Niger	Ibrahim Badamasi Babangida University, Lapai	552	59
	Total	3239	346

Sources: The Universities Websites (2024)

The study utilized two instruments designed by the researcher titled: the Functionality of Security Services Questionnaire (FSSQ) and Lecturers Job Performance Questionnaire (LJPQ) for data collection.

The Functionality of Security Services Questionnaire has 8 items on a 5-points Likert's rating scale and the Lecturers Job Performance Questionnaire has 17

items on a 5-point Likert's scale, with a satisfactory score of 3.00 points or higher, and a score below 3.0 is considered unsatisfactory in state-owned universities in Nigeria.

The FSSQ was certified as face and content valid by the experts at Department of Educational Foundations, Faculty of Education and Extension Services, Usmanu Danfodiyo University, Sokoto Usmanu Danfodiyo University, Sokoto. After thorough corrections, two items were re-cast, and additional two items were added, and the instrument was considered adequate to measure the subject in question. The items were thus accepted for use in the study.

The reliability of the FSSQ was obtained via trial testing, FSSQ was administered to 30 lecturers at Plateau State University and Benue State University. The Cronbach's alpha was used to analyze the data resulting in a stability of 0.73. This indicates the instrument's reliability for use in the study.

The reliability of the Lecturers Job Performance Questionnaire (LJPQ) was obtained via trial testing. LJPQ was administered to 30 lecturers at Plateau State University and Benue State University. Cronbach's alpha was used to analyze the data and the results showed an internal consistency of 0.82, indicating the instrument's reliability.

The researcher received an introduction letter from the Faculty Officer, Dean's Office, FEES, Usmanu Danfodiyo University, Sokoto, to introduce herself to the selected universities for the study. This formal introduction allowed the universities to cooperate with the researcher, ensuring successful administration of instruments. The researcher also provided training to research assistants to aid in the distribution and retrieval of instruments during data collection, ensuring good control and completing the exercise within the scheduled time. Instruments were administered and retrieved one hundred percent without any loss.

The study used mean and standard deviation in analyzing the data in response to descriptive data via Statistical Package for Social Science (SPSS). The hypothesis was tested using Pearson Product Moment Correlation Coefficient (PPMC). P-value was compared at 0.05 level of significance.

The data analyzed are presented below:

Research Question One: What is the level of functionality of security service in States Universities, North-Central, Nigeria?

Table 2: Mean and Standard Deviation Assessing the Level of Functionality of Security Service in the State Universities North Central, Nigeria

S/N	Level of Functionality of Security Service	N	Mean	SD	Decision
1	Gate duties to check entry and exist of vehicles are functioning effectively in my school	346	3.32	.897	Sometimes Functional
2	University security staff effectively perform guard duties at critical facilities in the university.	346	3.30	.939	Sometimes Functional
3	University security staff effectively perform patrol duties covering the entire university environment at all times.	346	3.14	.929	Sometimes Functional
4	Security vehicles in the university are always unfairly maintained for road worthiness in my school	346	3.29	1.00	Sometimes Functional
5	Security vehicles in my school are always fuelled for construct movement.	346	3.40	.988	Sometimes Functional
6	ICT and CCTV facilities for security operations are always in very good condition for round the clock operation in my school	346	3.29	.977	Sometimes Functional
7	My school perimeter fence and gates are always in good condition for optimum security of staff and student on campus	346	3.33	1.01	Sometimes Functional
8	My school security dogs are always well trained, and fed for efficient security duties.	346	3.34	.966	Sometimes Functional
	Average Mean	346	3.30	.963	Sometimes Functional

Source: Fieldwork (2024) Criterion Mean = 3.00

KEY: Rarely Functional: Less than 3.00, Sometimes functional: 3.00 – 4.00
Always Functional: 4.00 – 5.00

Table 2 shows descriptive statistics of Mean and Standard Deviation computed to assess the level of functionality of security service in States Universities, North-Central Zone, Nigeria. The results also revealed that all the mean ratings for all the descriptor statements were greater than the Criterion Mean of 3.00 which implies that all the statements were accepted by the participants. However, the overall mean rating of the level of functionality of security service in States Universities, North-Central, Nigeria (Average mean = 3.30 and Standard Deviation = .963) implies that there was moderate level of functionality of security service in States Universities, North-Central, Nigeria.

Research Question Two: What is the Level of Lecturers' Job Performance in the State Universities North Central Zone, Nigeria?

Table 3: Mean and Standard Deviation Assessing the Level of Lecturers' Job Performance in the State Universities North Central Zone, Nigeria

S/N	Lecturers' Job Performance Items	N	Mean	SD	Decision
1	I presents my lesson logically step by step	346	4.40	0.85	V. High
2	I use appropriate teaching method in presenting the lessons	346	4.38	0.73	V. High
3	I use appropriate instructional materials to illustrate my lesson	346	4.21	0.92	V. High
4	I apply sense of humor and jokes to reduce tension in class	346	4.28	0.89	V. High
5	I allow students to ask questions	346	4.33	0.89	V. High
6	I patiently answer students questions without annoyance	346	4.40	0.79	V. High
7	I ask students question during the introduction, presentation and conclusion.	346	4.21	0.96	V. High
8	I maintain reasonable silence during lesson delivery	346	4.18	0.86	High
9	I control unnecessary movements during lesson delivery	346	4.12	0.90	High
10	I control disruptive behaviors such as phone-cells, and social media browsing during lessons	346	4.20	0.98	High
11	I have publications in reputable journals	346	4.23	0.88	V. High
12	I have published textbooks in their field of specialization	346	4.04	0.97	High
13	I have presented papers in conferences	346	4.16	0.90	High
14	I have served as resource persons during professional workshops	346	3.60	1.38	High
15	I have rendered consultancy services in public and private sectors	346	3.37	1.41	Moderate
16	I participate in radio & T/V program	346	3.09	1.53	Moderate
17	I participate in community activities	346	3.72	1.39	High
	Average Mean	346	4.05	1.01	High

Source: Fieldwork (2024) Criterion Mean = 3.00

Key: Moderate: 3.00-3.50,

High: 3.51-4.00,

Very High: 4.01-5.00

Table 3 shows descriptive statistics of Mean and Standard Deviation computed to assess the level of Lecturers' job performance in the state universities North Central, Nigeria. The results also revealed that all the Mean ratings for all the descriptor statements were greater than the Criterion Mean of 3.00 which implies that all the statements were accepted by the participants. However, the overall mean rating of the lecturers' job performance (Average mean = 4.05 and Standard Deviation = 1.01) implies that there was high level of Lecturers' job performance in the state universities North Central, Nigeria.

Analysis of Null Hypothesis

There is no significant relationship between Functionality of Security Services and Lecturers' Job Performance in the state universities North Central, Nigeria.

In testing null hypothesis one (H_{01}), the scores of the responses collected from the 346 participants who responded to the research instrument on Functionality of Security Services and Lecturers' Job Performance in the state universities North Central, Nigeria were organized and analyzed electronically using inferential statistics of Bivariate Pearson's Product Moment Correlation Coefficient as presented in Table 4.

Table 4: Pearson's Correlation Coefficient for Relationship between Functionality of Security Services and Lecturers' Job Performance in the state universities North Central, Nigeria

Variable	N	Mean	Std. Dev	Df	r-Cal	p-Value	Decision
Functionality of Security	346	3.3909	0.7060	344	0.256**	0.001	H_{09}
Job Performance	346	4.0541	0.4782				Rejected

Source: Fieldwork, 2024

Table 4 is a summary of bivariate Pearson's correlation performed to establish the degree of relationship between functionality of Security services and Lecturers' job performance in the state universities North Central, Nigeria. The results of the analysis $r(344) = 0.256$, $p < 0.05$ revealed that there was significant low positive relationship between functionality of Security services and Lecturers' job performance in the state universities North Central, Nigeria. However, since the p -Value of 0.001 is less than 0.05 level of significance, the null hypothesis nine (H_{01}) which states that there is no significant relationship between functionality of security services and Lecturers' job performance is also rejected. This means that there is significant low positive relationship between functionality of security services and Lecturers' job performance which demonstrated that the higher the functionality of the security services, the higher the Lecturers' Job performance in the state universities North Central, Nigeria.

Summary of Findings

The study assessed the correlation of security service functionality and lecturer's job performance in state universities, North Central, Nigeria. The results indicated that

1. The finding revealed that security services were sometimes functional in state universities, North Central, Nigeria.
2. There was very high level of Job performance among the Lecturers in the state universities North Central, Nigeria.
3. There was significant low positive relationship between security services and Lecturers' job performance in the state universities North Central, Nigeria.

Discussion

Answer to research question one that states, what is the level of functionality of security services in state universities, North Central, Nigeria. The finding revealed that security services were sometimes functional in state universities, North Central, Nigeria. The finding was in line with Joseph *et al.* (2024) whose finding confirmed that there was moderate level of functionality of school social services in Universities, North Central, Nigeria.

Answer to research question two that states, what is the level of lecturers' job performance in state universities, North Central, Nigeria. The finding revealed that lecturers of state universities, North Central, Nigeria have high level of job performance. The finding was in line with Oyewole, *et al.* (2019) who found that the impact of lecturers' job performance was moderate with high internal efficiency better work environments and instructional resources correlate with improved performance level of the overall level of the lecturers' job performance is often moderate with strong commitment to teaching.

Result in the hypothesis states that there is no significant relationship between functionality of security services and lecturers' job performance in state universities North Central, Nigeria. The findings revealed that there was significant low positive relationship between functionality of security services and lecturers' job performance in state universities North Central, Nigeria. The finding is in line with Mwangi, Omondi and Chebet (2021) who found digital security system improve workplace productivity. This finding is also in line with Adebayo, Ojo and Mohammed (2018) who emphasized the need for modern surveillance technologies in school security provision.

Conclusion

Based on the presented findings, the study concluded that, there was low positive significant relationship between functionality of security services and lecturers' job performance in state universities, North Central, Nigeria which demonstrated that the higher the functionality of the school security services, the higher the lecturers' job performance in state universities, North Central, Nigeria.

Recommendations

Based on the conclusion of this study, the following recommendations are put forward:

1. In as much as the school security services are sometimes functional, there is a need for adequate improvement in its functionality for the purpose of job effectiveness among the lecturers. The quality and accessibility of security services should be regularly evaluated, ensuring that they meet the diverse needs of lecturers.
2. Since there is high level of job performance among the lecturers, the management in collaboration with the government to improve/provide adequate incentives to encourage proper delivery of services among the lecturers.
3. The university management should invest in modern security infrastructure such as perimeter fencing, secure access control and emergency response system. Also, enhancing physical security can improve working environment and peace of mind for the lecturers.

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Impact of Banditry and Cattle Rustling on Internally Displaced Persons (IDPS) in Sokoto East Senatorial Zone: Implications for Counselling

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Abstract

The study examined the impact of banditry and cattle rustling on internally displaced persons (IDPS) in Sokoto east senatorial zone: implications for counselling. Descriptive survey research design was used in this Study. The target population is thirty three thousand and sixty six household (33066) within fifteenth 15 internally display persons (IDPs Camps) in Sokoto East Senatorial Zone. A purposive and proportionate sampling technique is employed in selected 381 household Participants across 10 IDPs camps in Sokoto East Senatorial Zone. The instrument used for this study is a researcher designed instruments entitled; Impact of Banditry and Cattle Rustling on IDPs (IBCRIDPS). The questionnaire is a closed-ended type with four-points rating scale which were coded as Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1); The reliability index was founded 0.762, using Cronbach Alpha coefficient. The data collected were analyzed using frequency count and mean statistics. The decision rule is such that any mean score of 2.50 and above were regarded agree and mean scores less than 2.50 were deemed as disagree. The study findings shows that religion plays a supportive role for internally Displaced Persons (IDPs) affected by banditry and cattle rustling in Sokoto East Senatorial Zone. The religion promotes tolerance, peace, acceptance of God's will, and creativity among victims. The findings reveal that various counselling strategies have been effectively applied to support IDPs affected by banditry and cattle rustling in Sokoto East Senatorial Zone. E,g sensitization, motivational talks, behavioural therapy, psycho-educative, and cognitive techniques are helping victims manage trauma, rebuild resilience, and recover from the psychological and emotional impact of violent displacement., some part of the recommendations the government should Complementing livelihood programs, direct and targeted financial assistance (e.g., cash transfers or micro-grants) should be provided to vulnerable IDP households. This helps address immediate needs, stimulates local economies, and empowers IDPs to make their own recovery choices.

Keywords: Banditry, Cattle and Rustling, counselling strategies, Religion impact, Economic Impact, Internal Displace Persons (IDPS)

Introduction

Banditry and cattle rustling have plagued Nigeria for decades, posing significant challenges to security, socio-economic development, and human rights. According to Mustapha (2019) banditry in Nigeria often involves armed attacks, robbery, kidnapping for ransom, and other forms of violence targeting civilians, communities, or specific groups. Banditry is a term used to refer to acts of robbery and violence in areas where the rule of law has broken down (Collins, 2021). According to Warty (2024) defines banditry as an act of crime committed either by the residents of a village or people in the low economic and social strata in order to fulfill their basic needs such as food, clothing and shelter. Ahmed & Mohammed (2020) elucidates that cattle rustling is a prevalent form of organized crime in Nigeria, often perpetrated by armed criminal groups or individuals operating in rural areas where pastoralism is prevalent. These criminal activities involve the forcible taking of cattle from livestock owners through armed attacks, raids on villages, or clandestine theft, leading to economic losses, social disruption, and insecurity within affected communities. According to Cohen & Deng (2018), IDPs often face similar challenges to refugees, including displacement, loss of livelihoods, lack of access to basic services, and heightened vulnerability to exploitation and abuse, but they remain within the borders of their own country.

The concept of cattle rustling is almost generally applied to represent the act of stealing cattle from a grazing herd notwithstanding the motivation or contextual specifics (Bashar & Mustapha 2021). Cattle rustling as being practiced today in Nigerian states of Zamfara, Sokoto, Kaduna and Katsina experience the robbery of cattle at a large scale by heavily armed organized gun-men whose activities also extend to terrorizing villages, community banditry and other related and more devastating operations (Bashar & Mustapha 2021). Aisha & Nasir (2019) emphasize that cattle rustling often involves armed attacks, raids on villages, and collusion between criminal networks and corrupt officials, posing significant challenges to law enforcement and governance in affected areas. Idris (2018) have highlighted how the loss of cattle due to rustling can devastate pastoralist households, leading to decreased income, food insecurity, and increased poverty levels. The economic consequences extend beyond immediate losses, as the

disruption of livestock production and trade networks undermines long-term agricultural productivity and rural development efforts.

Banditry and cattle rustling have emerged as significant security challenges in Sokoto East senatorial zone, Sokoto State, Nigeria, with profound implications for the welfare of internally displaced persons (IDPs) in the region. According to Ilo *et al.* (2018), Sokoto State has experienced a surge in banditry and cattle rustling activities, driven by factors such as rural poverty, ethnic conflicts, and weak law enforcement. The escalation of violence has led to the displacement of communities, exacerbating the vulnerability of IDPs who have been forced to flee their homes in search of safety. Abdulmalik & Yahuza (2019) highlight the devastating impact of banditry and cattle rustling on affected communities in Sokoto East senatorial zone. The violence has resulted in loss of lives, destruction of property, and disruption of socio-economic activities, leading to widespread fear and insecurity among residents. As noted by Ibrahim & Aliyu (2020), the insecurity in Sokoto East senatorial zone resulting from criminal activities hinders economic growth, disrupts agricultural productivity, and undermines social cohesion in affected communities.

The situation is further compounded by the displacement of individuals and families, as IDPs face heightened risks of food insecurity, malnutrition, and disease outbreaks. Internally displaced persons (IDPs) refer to individuals or groups who have been forced to flee their homes or places of habitual residence due to armed conflict, violence, natural disasters, human rights violations, or other emergencies, but who have not crossed an international border. Onyekuru (2019) have emphasized how economic hardships and lack of livelihood opportunities push individuals and families to migrate in search of better prospects, often resulting in displacement. Vulnerable populations, including women, children, and internally displaced persons, are disproportionately affected by socio-economic disparities, further exacerbating their risk of displacement. Addressing socio-economic inequalities through poverty reduction initiatives and inclusive development policies is crucial for preventing and mitigating internal displacement in Nigeria.

Intersection of religion on banditry and cattle rustling among internally displaced persons (IDPs) have highlights the complex dynamics at play in shaping the region's security landscape. Yusuf & Mohammed (2020) have explored how religious ideologies and beliefs influence the behaviour and motivations of bandits and cattle rustlers operating in the area. Religion,

particularly Islam, plays a significant role in shaping social norms, values, and perceptions of justice among both perpetrators and victims of violence.

Economic effects among internally displaced persons (IDPs) have highlights the significant challenges faced by displaced individuals and communities in accessing livelihood opportunities, financial resources, and basic necessities. Aliyu & Musa (2018) have documented how displacement disrupts economic activities, leading to loss of income, assets, and productive resources for affected. Moreover, research findings underscore the role of economic factors in driving displacement and perpetuating cycles of vulnerability and marginalization. The displacement crisis disrupts market dynamics, labour markets, and agricultural production, leading to increased competition for scarce resources and heightened socio-economic tensions among displaced and host populations (Sani & Ahmed, 2020).

Counselling strategies employed to support internally displaced persons (IDPs), underscores the importance of psychosocial support and mental health services in addressing the unique needs of displaced populations. Yusuf and Hassan, (2020) have explored various counselling approaches and interventions aimed at promoting resilience, coping mechanisms, and emotional well-being among IDPs in the region. Counselling strategies encompass a range of psychosocial interventions, including individual counselling, group therapy, trauma focused interventions, and community-based support programs (Yusuf & Hassan, 2020). Moreover, research findings emphasize the role of culturally sensitive and contextually appropriate counselling techniques in addressing the diverse needs of IDPs in Sokoto State.

Additionally, inadequate funding, human resource constraints, and weak institutional capacity pose challenges to the implementation and scale-up of counselling programs for IDPs. In conclusion, counselling strategies are essential for supporting internally displaced persons affected by banditry and cattle rustling in Sokoto East Senatorial Zone, Sokoto State. The humanitarian crisis resulting from banditry and cattle rustling has attracted attention from both local and international organizations. Given the complex and multifaceted nature of the challenges posed by banditry and cattle rustling in Sokoto East senatorial zone, there is a critical need for empirical research to assess the impact on internally displaced persons and inform evidence-based interventions. Thus, this study aims to investigate the impact of banditry and

cattle rustling among IDPs in Sokoto East senatorial zone, providing insights that can inform policy formulation and humanitarian action.

Statements of the Problems

The Sokoto East senatorial zone, like many other regions in Nigeria, grapples with the complex and pervasive issues of banditry and cattle rustling, which have resulted in the displacement of numerous individuals and communities. As noted by Ibrahim & Yusuf (2020), the insecurity in Sokoto East senatorial zone resulting from criminal activities hinders economic growth, disrupts agricultural productivity, and undermines social cohesion in affected communities. However, there is a gap in understanding the specific nature and extent of this impact, as well as the underlying factors contributing to the phenomenon.

The main issue we're studying understands how banditry and cattle rustling affect IDPs in Sokoto East senatorial zone by explore the socio-economic consequences, religion effect and counselling strategies resulting from displacement due to banditry activities. Identifying the underlying factors contributing to these security challenges is essential for developing comprehensive strategies to mitigate their impact and prevent future occurrences.

Objectives of the Study

The main objective of this research is to investigate the impact of banditry and cattle rustling on internally displaced person (IDP) in Sokoto east senatorial zone and implication for counselling. The specific objectives are to;

1. Identify the religion effect of banditry and cattle rustling among internally displaced person (IDP) in Sokoto East Senatorial Zone, Sokoto State.
2. Identify the economic effect of banditry and cattle rustling to the internally displaced person (IDP) in Sokoto East Senatorial Zone.
3. Identify the counselling strategies to be Utilize among internally displaced person (IDP) in Sokoto East Senatorial Zone, Sokoto State.

Research Questions

This study aimed to provide answers to the following questions

1. What is the religion effect of banditry and cattle rustling among internally displaced person (IDP) in Sokoto East Senatorial Zone, Sokoto State?
2. What is the economic effect of banditry on internally displaced person (IDP) in Sokoto East Senatorial zone, Sokoto State.?
3. What are the Counselling strategies could be utilized among internally displaced person (IDP) in Sokoto East Senatorial Zone, Sokoto State?

Methodology

The research design employed for this study is a descriptive survey research design. The target population is thirty-three thousand and sixty-six household (33066) within fifteenth 15 internally display persons (IDPs Camps) in Sokoto East Senatorial Zone. A purposive and proportionate sampling technique is employed in selected 381 household Participants across 10 IDPs camps in Sokoto East Senatorial Zone. This sample size was drawn based on the guide of the research advisor, 2006 table. The instrument used is a researcher designed instruments entitled; Impact of Banditry and Cattle Rustling on IDPs (IBCRIDPS). It was arranged in two sections. Section one consists of demographic information of the respondents. Section two, consists Impact of Banditry and Cattle Rustling on IDPs (IBCRIDPS) to be measured, with (15) questions carefully arranged in clusters, A, B and C which seek to provide answers to the research questions. The instrument is closed ended with four-points rating scale which were coded and weighted as follows: Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). The instrument was validated by the experts, from counselling psychology department, faculty of education Sokoto State University, Sokoto. The instrument was considered suitable by the experts for the study after the corrections. To ascertain the reliability of the instrument, the questionnaire was administered to thirty (30), respondents. Reliability was computed using Cronbach Alpha, reliability index was founded at 0.76. The data collected were analyzed using frequency count and mean statistics. The decision rule; any mean score of 2.50 and above were regarded agree and mean scores less than 2.50 were deemed as disagree.

Results

This section highlights the analysis of the research questions earlier raised in the study. The analysis was done using frequency counts and percentage distribution.

Research Question one

What is religion effect of banditry and cattle rustling among internally displaced person (IDP) in Sokoto East Senatorial Zone, Sokoto State?

Table 1: Religion Effect of Banditry and Cattle Rustling among (IDPS)

S/N	Statement	N	Mean	Std. Devia	Remarks
1	Religion teachers how to tolerate one another in the IDP camp	381	3.63	.764	Agree
2	Followers of religion live in peace with other community	381	2.99	1.187	Agree
3	IDPs use religion as a source of forgiveness	381	2.66	1.247	Agree
4	Religion teachers how to accept the degree of God	381	3.24	1.012	Agree
5	Religion teaches IDPs victim on how to be creative	381	3.47	.769	Agree
Grand Total		381	3.198	0.996	Agree
2.50 bench mark					

Table 1, show the religion effect of banditry and cattle rustling among internally displaced person (IDP) in Sokoto East Senatorial Zone, Sokoto State. The Item 1 shows respondents agreed that Religion teachers to tolerate one another in the IDP camp, with the mean score, 3.63 which greater than 2.50 bench mark. Items 2 indicated the respondents agreed that Followers of religion live in peace with other community, with the mean score 2.99 which higher than 2.50 bench mark. Item 3 indicated the respondents agreed that IDPs use religion as a source of forgiveness, with the mean score 2.66 which is higher than 2.50 bench mark. Item 4 indicated the respondents agreed that religion teachers how to accept the degree of God with mean score 3.24 which higher than 2.50 bench mark. Item 5 indicated the respondent agreed that Religion teaches IDPs victim on how to be creative with the mean score 3.47 which higher than 2.50 bench mark. The analysis shows that religion plays a supportive role for internally Displaced Persons (IDPs) affected by banditry and cattle rustling in Sokoto East Senatorial Zone. The respondents agreed that religion promotes tolerance, peace, acceptance of God's will, and creativity among victims, grand mean of 3.19 which significantly greater than 2.50 bench mark.

Research Question Two

What is the economic effect of banditry and cattle rustling on internally displaced person (IDP) in Sokoto East Senatorial zone, Sokoto State?

Table 2: Economic Effect of Banditry and Cattle Rustling among (IDPS)

S/N	Statement	N	Mean	Std. Deviation	Remarks
1	Various Shops in the area were burnt	381	2.94	1.210	Agree
2	Markets in the affected area were closed	381	2.96	1.180	Agree
3	Animal rearing activities was crippled in the affected area	381	3.36	.881	Agree
4	Business activities affected	381	3.09	1.157	Agree
5	Money and property were also lost in the affected area	381	3.09	1.178	Agree
Grand Total		381	3.088	1.117	Agree

2.50 bench mark

Table 2, shows the economic effect of banditry and cattle rustling on internally displaced person (IDP) in Sokoto East Senatorial zone, Sokoto State. Item 1 shows the respondents agreed that Various Shops in the area were burnt, with the mean score 2.94 which higher than 2.50 bench mark. Items 2 indicated the respondent agreed that markets in the affected area were closed, with mean score 2.96 which higher than 2.50 bench mark. Item 3 indicated the participants agreed that animal rearing activities was crippled in the affected area with the mean score 3.36 which higher than 2.50 bench mark. Item 4 indicated the participants agreed that Business activities affected the degree of God, with the mean score 3.09 which higher than 2.50 bench mark. Item 5 indicated the participants agreed that money and property were also lost in the affected area, with the mean score 3.09 which higher than 2.50 bench mark. The results reveal that banditry and cattle rustling have had severe economic impacts on IDPs in Sokoto East Senatorial Zone, with the grand mean 3.088 of the respondents confirming the destruction of shops, closure of markets, collapse of animal rearing, disruption of business activities, and loss of money and property as greater than bench mark.

Research Question Three

What is the Counselling strategies could be utilized among internally displaced person (IDP) in Sokoto East Senatorial Zone, Sokoto State?

Table 3: Counselling Strategies among Internally Displaced Person (IDP)

S/N	Statement	N	Mean	Std. Deviation	Remarks
1	Sensitization, orientation, motivational talk	381	3.43	.890	Agree
2	The counsellor used creative strategies in the IDP camp	381	3.18	1.145	Agree
3	Behavioural method was used in IDP	381	2.99	1.221	Agree
4	Psycho-educative strategy in the IDP camp	381	2.99	1.22	Agree
5	Cognitive Techniques was use in the IDP Camp.	381	3.07	1.166	Agree
Grand Total		381	3.132	1.128	Agree

2.50 bench mark

Table 3 show the Counselling strategies could be utilized among IDPs in Sokoto East Senatorial Zone, Sokoto State. Item 1 shows the respondents agreed that Sensitization, orientation, motivational talk, with the mean score 3.43 which higher than 2.50 bench mark. Items 2 indicated the participants agreed that, the counsellor used creative strategies in the IDP camp with the mean score 3.18 which higher than 2.50 bench mark. Item 3 indicated the respondents agreed that Behavioural method was used in IDP with mean score 2.99 which higher than 2.50 bench mark. Item 4 indicated the respondents agreed that Psycho-educative strategy in the IDP camp the degree of God, with the mean score 2.99 which higher than 2.50 bench mark. Item 5 indicated the respondents agreed that Cognitive Techniques was use in the IDP Camp, with mean score 3.07 which higher than 2.50 bench mark. The results reveal a various counselling strategies have been effectively applied to support IDPs affected by banditry and cattle rustling in Sokoto East Senatorial Zone. With the grand mean 3.132 of the respondents agree that, approaches such as sensitization, motivational talks, behavioural therapy, psycho-educative, and cognitive techniques are helping victims manage trauma, rebuild resilience, and recover from the psychological and emotional impact of violent displacement.,

Summary of Major findings

1. Religion plays a supportive role for Internally Displaced Persons (IDPs) affected by banditry and cattle rustling in Sokoto East Senatorial Zone.
2. Banditry and cattle rustling have had severe economic impacts on Internally Displaced Persons (IDPs) in Sokoto East Senatorial Zone.
3. Counselling strategies have been effectively applied to support IDPs affected by banditry and cattle rustling in Sokoto East Senatorial Zone.

Discussion

The study found that Religion plays a supportive role for Internally Displaced Persons (IDPs) affected by banditry and cattle rustling in Sokoto East Senatorial Zone. Religion promotes tolerance, peace, acceptance of God's will, and creativity among victims. The finding is in line with Yusuf & Mohammed (2020) have explored how religious ideologies and beliefs influence the behaviour and motivations of bandits and cattle rustlers operating in the area. Additionally, Yusuf and Mohammed (2020) research findings underscore the role of religious leaders and institutions in mediating

conflicts and promoting peace building efforts among IDPs affected by banditry and cattle rustling. However, views were divided on religion as a source of forgiveness, with many struggling to forgive due to the trauma caused by the violence. Overall, religion helps IDPs cope with the emotional and social effects of displacement in Sokoto East Senatorial Zone.

The study reflected that Banditry and cattle rustling have had severe economic impacts on Internally Displaced Persons (IDPs) in Sokoto East Senatorial Zone. The finding confirming the destruction of shops, closure of markets, collapse of animal rearing, disruption of business activities, and loss of money and property. The above is in line with Yusuf (2024) the study found that the presence and negative impacts of Banditry and cattle rustling include killing and kidnapping of farmers, chasing farmers out of their farmlands, seizing farmlands, theft of cattle, burning and raiding grain silos, and blocking local trade routes and negatively affected food security. Equally with Bashir & Mustapaha (2021) revealed that farmers–herdsmen conflict precipitates the acts of cattle rustling and banditry. It also revealed that conversely cattle rustling and banditry contributed to the farmers–herdsmen conflict and pose serious threat to the safety and security of the people.

The study found that Counselling strategies have been effectively applied to support IDPs affected by banditry and cattle rustling in Sokoto East Senatorial Zone. The counselling approaches such as sensitization, motivational talks, behavioural therapy, psycho-educative, and cognitive techniques are helping victims manage trauma, rebuild resilience, and recover from the psychological and emotional impact of violent displacement. The above finding is inconsistently with Kolo (2019) emphasized the need for comprehensive counselling strategies to address the root causes of banditry and cattle rustling, including socio-economic marginalization, ethno-religious tensions, and ineffective law enforcement. Moreover, there is a growing recognition of the importance of incorporating the perspectives and experiences of IDPs into policymaking and intervention efforts. Equally Nwogu (2017) supported the Collaborative of counselling approaches involving government agencies, civil society organizations, and local communities are seen as essential for mitigating the impact of banditry and cattle rustling on IDPs and restoring stability in affected regions.

Conclusion

The finding shows that Religion plays a supportive role such as promotes tolerance, peace, acceptance of God's will, and creativity among victims. The finding confirming the had severe economic impacts e.g. destruction of shops, closure of markets, collapse of animal rearing, disruption of business activities, and loss of money and property. Similarly, Counselling strategies have been effectively applied such as sensitization, motivational talks, behavioural therapy, psycho-educative, and cognitive techniques are helping victims manage trauma, rebuild resilience, and recover from the psychological and emotional impact of violent for Internally Displaced Persons (IDPs) affected by banditry and cattle rustling in Sokoto East Senatorial Zone. Conclusively, the study found that, there is negative impact of banditry and cattle rustling on internally displaced person (IDP) in Sokoto east senatorial zone and implication for counselling.

Recommendations

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

1. Formalize Partnerships with Religious Institutions: Recognizing the supportive role of religion, government, policymakers, and NGOs should establish formal frameworks for collaboration with religious leaders and organizations.
2. Provide Targeted Financial Assistance: Complementing livelihood programs, direct and targeted financial assistance (e.g., cash transfers or micro-grants) should be provided to vulnerable IDP households.
3. Scale up Effective Counselling Strategies: Since counselling strategies have been effectively applied, there's a clear imperative to significantly expand and normalize access to these proven methods.

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The Appraisal of Continuous Assessment Practices in Private and Public Secondary Schools in Lagos State

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Abstract

In Nigerian schools, continuous assessment is mostly concentrated on cognitive achievement to the detriment of affective and psychomotor domains of learning. This research work reports the findings of the appraisal of continuous assessment practices in public and private secondary schools in Lagos, Nigeria. Adopting a survey type of descriptive research, a self-developed questionnaire was administered on one hundred and twenty (120) respondents comprising teachers, vice-principals, and principals from ten (10) randomly selected secondary schools across five educational districts in Lagos state. Data collected was analyzed using descriptive statistics to answer the research questions. Based on the analysis conducted, it was found that continuous assessment is not properly practiced in most secondary schools in Lagos state due to the poor understanding of its concept by most teachers and their attitudes towards continuous assessment practices. It is recommended that teachers should be sent on special training that involves continuous assessment since they are the main implementers, to better their understanding and perceived roles concerning continuous assessment practices, and that school managers and the Government should be consistently and effectively involved, especially in areas of finance and supervision.

Keywords: Academic Performance, Appraisal, Assessment, Continuous Assessment, Continuous Assessment Practice

Introduction

In today's world, education is known to be the bedrock of every societal growth and a significant effort and resources, mostly human and material resources. This is because it is the process by which one passes from ignorance to knowledge; that is, money is being expended to fashion out the best form of learning process. Nigeria, as a country, has known the real essence of education; hence, the country is not left out of this process. The totality of educational investment is measured in the quality of the educational

product. Measuring the quality of educational products has been a great concern for Nigeria, which has led the country to evolve its educational assessment methods. In educational assessment, the nature, value, or performance of a student depends on the characteristic tendencies of the student himself, the teachers and their teaching modalities as well as their instructional materials, and the environment, that is, the school environment and the home.

One of the major focuses of the National Policy on Education, since its inception in 1977, is the practice of continuous assessment in the Nigerian educational system. They therefore recommended the use of continuous assessment for taking summative decisions on students' level of attainment at the end of any level of schooling

The Federal Government of Nigeria's Educational policy stipulated the adoption of the 6-3-3-4 educational system as a complete departure from the former 6-5-2-3 system in 1982, and was implemented in Lagos state in 1991. The 6 years of primary education, the 3 years of junior secondary education, the 3 years of senior secondary education, and the 4 years of university degree education, with emphasis on the use of Continuous Assessment at all levels of education.

Continuous assessment can also be described as an assessment approach that should depict the full range of sources and methods teachers use to gather, interpret, and synthesize information about learners, that is, information that is used to help teachers understand their learners, plan and monitor instruction, and establish a viable classroom culture.

The goal of every teacher in the classroom is to impart knowledge, and the main aim of teaching is to help the learners acquire or change certain skills, attitudes, knowledge, ideals, or appreciation (Adeyinka, 2000). In other words, the focus of teaching is to bring about some desirable changes in the learner's behavior. Teaching is said to be effective only when the learners have been able to achieve the behavioral objectives, and to accomplish these objectives, the teachers explain, demonstrate, ask questions, give assignments, raise problems, use teaching aids, hold discussions, conduct quizzes and projects, which are all forms of continuous assessment.

Teachers are the most vital resources in the educational industry because they translate educational policies to the students through teaching and learning

practices, as well as translate programs into actions. They are equally accountable for the set goals and objectives, evaluating the degree of achievement of the students, and accepting responsibility for any inadequacies in the students' performances. In other words, the teachers ensure that there is progress in the task entrusted in their care so that the stipulated goals are achieved. The National Policy on Education acknowledges this when it states that "no educational system can rise above the quality of its teachers" (FRN, 2004).

One of the functions of a school is the certification of the individual learner under its embrace, and to effectively carry out this role, an assessment of one kind or the other is a prerequisite (Idowu and Esere, 2009). To effectively assess the students, the various schools need to continuously examine them, not just a one-shot examination at the end of the academic year. This is because a particular student might not be feeling well at the time the exam is being conducted, or a student who might be fortunate to memorize a particular topic just for the exam. In deciding a student's performance in a given subject, depending only on one final examination administered at the tail end of the course is very unjust and unreliable, as performance in that one examination could have been affected by examination malpractices or chance luck.

Since continuous assessment helps to pace the student's learning, motivates the students to study, reveal specific areas of learning difficulties and provides feedback to the students and teachers, and is also perceived as a process that offers comprehensive assessment of the students' learning in terms of wide coverage of the syllables taught, using a variety of assessment techniques and taking into account students' performance over a period of time in a variety of situations, one may obviously ask "if the practice of continuous assessment in schools is such a good thing, why do scores derived from it not correlate with external examination scores?" Or is it that the educators correlate "unlike terms"? In today's world, education is known to be the bedrock of every societal growth, significant effort, and resources, mostly human and material. It is the process by which one passes from ignorance to knowledge; that is, money is being expended to fashion out the best form of learning process. Nigeria, as a country, has known the real essence of education; hence, the country is not left out of this process. The totality of educational investment is measured in the quality of the educational product. And measuring the quality of educational products has been of great concern for Nigeria, as the country has been evolving educational assessment methods. In educational assessment,

the nature, value, or performance of a student depends on the characteristic tendencies of the student himself, the teachers and their teaching modalities as well as their instructional materials, and the environment, that is, the school environment and the home.

One of the major focuses of the National Policy on Education, since its inception in 1977, is the practice of continuous assessment in the Nigerian educational system. They therefore recommended the use of continuous assessment for taking summative decisions on students' level of attainment at the end of any level of schooling

Continuous assessment can also be described as an assessment approach that should depict the full range of sources and methods teachers use to gather, interpret, and synthesize information about learners, that is, information that is used to help teachers understand their learners, plan and monitor instruction, as well as establish a viable classroom culture. Continuous Assessment is a teacher-directed assessment procedure with the aim that the result is included as part of the public assessment. Nevertheless, there have been arguments raised that the issues of quality, scoring, grading, and comparability of standards of the assessment tools could vary from one school to another (Osunde, 2007; Gani & Attah, 2015).

The goal of every teacher in the classroom is to impart knowledge, and the main aim of teaching is to help the learners acquire or change certain skills, attitudes, knowledge, ideals, or appreciation (Adeyinka, 2000). In other words, the focus of teaching is to bring about some desirable changes in the learner's behavior. Teaching is said to be effective only when the learners have been able to achieve the behavioral objectives, and to accomplish these objectives, the teachers explain, demonstrate, ask questions, give assignments, raise problems, use teaching aids, hold discussions, conduct quizzes and projects, which are all forms of continuous assessment.

According to Okoli (2005), the purpose of education is to bring about desirable changes in the behavior of school children, and these changes must not only be relatively permanent but should also be retained and transferred to out-of-school settings. The expected changes are in the areas of cognitive, affective, and psychomotor. He further classified the various assessment tools according to the three domains of learning, thus:

1. Instruments for assessing cognitive behavior include the teacher-made achievement tests, standardized achievement tests, intelligence tests, aptitude tests, and teacher ratings.
2. Instruments for assessing the affective behavior include attitude scales, interest inventories, personality tests, and sociometric tests.
3. Instrument for measuring the psychomotor behavior includes performance tests, observational checklists, and rating scales.

Today, continuous assessment is generally acceptable and used in all Nigerian educational levels for both promotional and graduation purposes.

Since continuous assessment helps to pace the student's learning, motivates the students to study, reveal specific areas of learning difficulties and provides feedback to the students and teachers, and is also perceived as a process that offers comprehensive assessment of the students' learning in terms of wide coverage of the syllables taught, using a variety of assessment techniques and taking into account students' performance over a period of time in a variety of situations, one may obviously ask "if the practice of continuous assessment in schools is such a good thing, why do scores derived from it not correlate with external examination scores?" Or is it that the educators correlate "unlike terms," or is there some problem with the procedures in the conduct of continuous assessment?

Statement of the Problem

The case of exam mal-practices, students' miss-conduct as well as poor performances among our secondary school students is increasingly becoming unbearable and the problem of continuous assessment practices in most of these schools is so alarming that people no longer trust the school certificate gotten with reasons that the students are half-baked, especially when a student cannot comfortably pass an external examination without one form of cheating or the other. Examination malpractices take place at each of the following three stages: before examination, during examination, and after examination.

Before examination:

These include collusion agreement between candidates, a syndicate, parents and school authorities, exam bodies, or a creative winding combination to create ingenious modus operandi to cause leakages.

During examination: These include:

1. Cheating, that is, part of the lecture notes. Illicit material copying
2. Exchanging answer sheets
3. Trading points
4. Use of signals
5. Writing on private parts
6. Impersonation, which is a false declaration to be another person.

After examination: These include:

1. Cheating
2. Deliberate mistakes in adding up for those who staple currency notes or plead in the name of God
3. Use of the examination center to discern geographical areas to favor or penalize
4. Alteration of scores.

Various forms of reappraisal have also shown the inconsistencies in the practices of continuous assessment and the decline in students' performances in various subjects in the school system and a lot of them point accusing fingers at the different bodies that are responsible for the evaluation of the schools at various level, such as the teachers, and the school continuous assessment committee, as well as the guidance and counseling at all levels of education and other examination bodies like West African Examination Counsel (WAEC), Joint Admission and Matriculation Board (JAMB), etc. This is because the evaluations carried out by these bodies do not give concise and reliable results, and this has led most universities to introduce the screening test for products of these examination bodies before admitting them.

Advocates of this examination malpractices include the parents or guardians, invigilators or supervisors, and other members of the school community. Adenipekun (2007) noted that during the last Joint Admission and Matriculation Board examination, a student was caught with a mobile phone trying to copy a text message from it, downloading the message, it was discovered that it was answers to the English language paper one questions, which was sent to him by his mother and smuggled in by one of the internal invigilators. Adeyinka (2000) also identified lack of discipline in schools and teachers' attitudes to work as causes of examination malpractice. He pointed

out that most teachers are not committed to their work and, as such, do not cover the syllabus for the subjects.

The above-stated facts clearly portray the cumbersome educational system as a result of the poor practice of continuous assessment, hence, the necessity of appraising the practices of continuous assessment in our secondary schools, particularly in Lagos

Objectives of Study

This research work is designed to investigate the quality of continuous assessment practices in private and public schools in Lagos State. It seeks to assess the following:

1. Understanding the benefits of continuous assessment practices in public and private secondary schools in Lagos State
2. Attitudes and perceptions of students and teachers in the practices of continuous assessment

Research Questions

The study sought to answer the following research questions:

1. What are the benefits of continuous assessment practices in secondary schools in Lagos state?
2. What are the attitudes and perceptions of students and teachers in the practices of continuous assessment

Methodology

This study adopted a survey-type descriptive research design to investigate the appraisal of continuous assessment practices in secondary schools in Lagos State. The descriptive survey method is a type of research survey that is used to collect data that will enable the researcher to describe systematically the characteristic features of a given population. It is only interested in the description of variables in relation to the population. The study population comprises the principals, vice-principals, and teachers in public and private secondary schools in Lagos Education District four.

A total of ten secondary schools (five private and five public secondary schools) were selected randomly from all the secondary schools in Lagos

State. In each of these selected schools, the principals, vice-principals, and teachers were randomly selected and used in the study, which gave a total of one hundred and twenty (120) participants. The teachers were the central unit of analysis in this study because they are the key factors in the practices of continuous assessment.

Results

Table 1: Understanding of the importance of continuous assessment practices in public and private secondary schools in Lagos State

S/N	Statement	Affirmative	Negative	Total
1.	The use of Information and Communication Technology (ICT) should be introduced in all secondary schools	120 (100%)	0 (0%)	120 (100%)
2.	Not all teachers have sound knowledge of the practice of continuous assessment	85 (71%)	35 (29%)	120 (100%)
3.	Schools that do not meet the stipulated standard of the practice of continuous assessment by the state Government should be sanctioned	110 (91%)	10 (9%)	120 (100%)
4.	Teachers should be sent on special courses involving continuous assessment	120 (100%)	0 (0%)	120 (100%)
5.	Teachers with no knowledge of the importance of continuous assessment practice should be sacked	95 (75%)	25 (21%)	120 (100%)
6.	Most teachers trivialize the practice of continuous assessment practice	70 (58%)	50 (42%)	120 (100%)

In the above analysis, section A, table 1, shows that one hundred percent (100%), that is, all the teachers agreed to the view that the use of Information and Communication (ICT) should be introduced in all secondary schools in Lagos State. About seventy-one percent (71%) of the teachers agreed with the view that not all teachers have sound knowledge of the practice of continuous assessment, while twenty-nine percent (29%) of the teachers disagreed in disagreement of the view.

It further reveals that ninety-one percent (91%) of the teachers agreed to the view that Schools that do not meet the stipulated standard of the practice of continuous assessment by the State Government should be sanctioned, while nine percent (9%) of them disagreed with this view.

It also shows that all the teachers agreed to the fact that Teachers should be sent on special courses involving continuous assessment. Seventy-nine percent (79%) of the teachers agreed that teachers with no knowledge of the importance of continuous assessment practice should be sacked, while twenty-one percent (21%) of the teachers disagreed with the view.

The table further observes that about fifty-eight percent (58%) of the teachers agreed with the view that most teachers trivialize the practice of continuous assessment, while forty-two percent (42%) of the teachers disagreed with the view.

In view of the above analysis explains that a proper understanding of the importance of continuous assessment practices would facilitate the proper and effective practice of continuous assessment in secondary schools in Lagos State. This could be done through the combination of several factors such as the use of Information and Communication Technology (ICT) in schools, introduction of courses that would enhance the practices of continuous assessment in schools, as trained teachers need to update their knowledge as well as all-around exposure to teachers as the main implementers of continuous assessment. The school managers should also be on alert to the proper implementation of continuous assessment, as well as the Government, both state and federal

Table 2: Attitudes and perceptions of students and teachers in the practices of continuous assessment

S/N	Statement	Affirmative	Negative	Total
1.	Continuous assessment is problem-based	10 (8%)	110 (92%)	120 (100%)
2.	Continuous assessment practice enhances instruction	120 (100%)	0 (0%)	120 (100%)
3.	Continuous assessment practice is student-centered	95 (79%)	25 (21%)	120 (100%)
4.	Continuous assessment practice does not give a concise picture of the student	0 (0%)	120 (100%)	120 (100%)
5.	Continuous assessment is society-centered	100 (83%)	20 (17%)	120 (100%)
6.	Continuous assessment gives a holistic picture of students' performance	120 (100%)	0 (0%)	120 (100%)
7.	The state Government Standards of	97	23	120

	continuous	(81%)	(19%)	(100%)
8.	Most students are fond of absenting themselves during assessments	118 (98%)	2 (2%)	120 (100%)
9.	Continuous assessment practice should be banned in schools because of poor management by the Government	0 (0%)	120 (100%)	120 (100%)

Table 2 shows that eight percent (8%) of the teachers agreed with the view that Continuous assessment is problem-based, while ninety-two percent (92%) of the teachers disagreed with the view. One hundred percent (100%), that is, all the teachers agreed to the view that Continuous assessment practice enhances instruction.

It further reveals that seventy-nine percent (79%) of the teachers agreed that of the teachers agreed to the view that Continuous assessment practice is student-centered. Twenty-one percent (21%) of the teachers disagreed with the view.

It also shows that all the teachers disagreed with the fact that Continuous assessment practice does not give a concise picture of the students. About eighty-three percent (83%) of the teachers agreed with the view that Continuous assessment is society-centered, while seventeen percent (17%) teachers disagreed with the view.

Furthermore, it shows that all the teachers agreed that Continuous assessment provides a holistic picture of students' performances. About eighty-one percent (81%) of the teachers agreed with the view that the State Government standards of continuous assessment practice are too cumbersome. In comparison, nineteen percent (19%) of the teachers disagreed with the view.

It further reveals that ninety-eight percent (98%) of the teachers agreed with the view that most students are fond of absenting themselves during assessment. Only two percent (2%) of the teachers disagreed with the view. And all the teachers disagreed with the fact that Continuous assessment practice should be banned in schools because of poor management by the Government

The above analysis explains that the attitudes and perceived roles of the students can greatly affect the practices of continuous assessment if not properly checked and controlled, and this can be achieved by giving both the teachers and students a proper orientation concerning continuous assessment alongside its importance to the general performances of the students, both in school and the society at large.

Discussion

The following is the discussion of the findings based on the analysis of the research questions:

Understanding of the importance of continuous assessment practices in public and private secondary schools in Lagos State

In view of the question above, the findings derived explained that a proper understanding of the importance of continuous assessment practices would facilitate effective practice of continuous assessment in secondary schools in Lagos State. This could be done through the combination of several factors, such as the use of Information and Communication Technology (ICT) in schools, the introduction of courses that would enhance the practices of continuous assessment in schools, and trained teachers who need to update their knowledge, as well as all-around exposure to teachers as the main implementers of continuous assessment. The school managers should also be on alert to the proper implementation of continuous assessment, as well as the Government, both state and federal; otherwise, continuous assessment will not be effectively practiced. Since civilization is the order of the day, our secondary schools should not be left out to remain in the past, but should be fully equipped with new technological tools and techniques in order to be able to compete with other developed countries in terms of educational standards. The result is in line with the findings of Koshal (2011), who observed that closed-book examination makes most students just to memorize all that is learnt without properly understanding them. Also, with this method, students are tempted to engage in examination malpractice.

Attitudes and perceptions of students and teachers in the practices of continuous assessment

The findings in question 2 reveal that the attitudes and perceived roles of the students and teachers have both negative and positive effect and can greatly affect the practices of continuous assessment if not properly checked and controlled, and this can be achieved by giving both the teachers and students a proper orientation concerning continuous assessment alongside its importance to the general performances of the students both in school and the society at large. Motivation goes a long way to encouraging someone to do better in any field of work; as such, the students and teachers should be occasionally motivated and encouraged not just to practice continuous assessment but to

love school activities and education as a whole. Right attitudes, they say, harvest good crops at their due season, and if the teachers and students have such attitudes at the back of their minds, education will be the envy of all, and teaching will be the most sought-after career, as there will not be much stress in the educational industries. This result aligns with Bakhshaliyeva (2023), who found that summative assessment serves as a means to evaluate students' overall academic achievement and understanding of instructional content after the completion of the learning period. Also, Chorpra (2022), observed that setting of examination paper is a strenuous and time-consuming task for teachers. Going further they noted that the teacher has to be thorough and ensure that the examination paper aligns with the purpose/reason for testing the students.

Recommendations

With respect to the above discussions of findings, it is important to make some useful recommendations that would be of paramount importance towards making the practice of continuous assessment very effective in order to elicit students' academic performance in our secondary schools.

The following recommendations are made

1. Enough funds should be allocated to schools by the State Government for the effective practices of continuous assessment
2. Teachers should be sent on special courses involving continuous assessment to improve their knowledge and increase their understanding of the practice
3. Proper appraisals of continuous assessment practice in secondary schools should be carried out by all educationists, as well as the state and federal governments.

Conclusion

Based on the data collected and analyzed, a proper understanding of continuous assessment practice by the teachers who are the main implementers of this practice, as well as good attitudes and perceptions concerning continuous assessment practice among teachers/students, are determinants of students' academic performance in secondary schools in Lagos State. The following conclusions were made:

1. The teachers, when motivated and properly monitored, do better
2. The teachers like to work in a conducive environment and with a small class size
3. Many secondary schools are understaffed
4. Teachers' inputs affect the quality of students produced by the school
5. Availability and adequacy of teachers determine the effectiveness of continuous assessment practice; in other words, school effectiveness and students' academic performance
6. Most of the teachers do not have a proper understanding of the practice of continuous assessment
7. Most teachers trivialize the practice of continuous assessment

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Lecturers' Welfare and Job Performance in State Owned Tertiary Institutions in Sokoto State, Nigeria

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Abstract

This study investigated the relationship between lecturers' welfare and job performance in state owned tertiary institutions in Sokoto state. Four objectives, four research questions and three null hypotheses were formulated for the study. The research employed a correlational design and the population of the study comprises of 2542 subjects. The Research Advisors Table (2006) was used to determine the sample size of 333 participants. Two sets of instruments titled: Lecturers' Welfare Rating Scale (LWRS) and Job Performance Rating Scale (JPRS) were used for data collection. The instruments were validated by three experts. The reliability of the instruments was obtained using test and re-test method and reliability indexes of 0.83 and 0.76, were obtained respectively. The researcher employed descriptive and inferential statistics for data analysis. The study found that the level of lecturers' salary and medical facilities was very low just as the level of lecturers' accommodation was low in state-owned tertiary institutions in Sokoto State. Therefore, the study concludes that there was low to moderate level of adequacy across various aspects of lecturers' welfare in state-owned tertiary institutions in Sokoto State. The paper recommended that salary of the lecturers should be improved by implementation of the appropriate scale and increment as approved by the federal government. This will make them have an improved job performance.

Keywords: Lecturer's Welfare, Job Performance, Salary, Accommodation, State Tertiary Institutions

Introduction

A good welfare package in tertiary institutions is considered necessary in lecturers' motivation (Tao, 2013). Tertiary institutions are established to shoulder the responsibility of ensuring the socio-economic development of the

country. However, it is noticed that, the mere provision or availability of lecturers in nation's education system is not enough to ensure socio-economic development of the country if such lecturers are not productive (Manga, 2004). It is unanimously agreed that human factor (not only teacher) is the most important of all the resources in any organization as it is the one that utilize and convert all other resources to required goods and services. Consequently, it is recognized globally that human resources are essential if growth and development of any organization has to be attained. It is, thus required that the management of any organization should find a way of getting best out of them. One of these ways is by ensuring that the available human resources are appropriately and adequately motivated through adequate welfare packages and improved condition of service.

Job performance can be regarded as the aggregate of employee behavior that has some expected values to organizations. If an individual teacher in tertiary institutions is able to accomplish his/her assigned duties successfully he is said to have good performance. Hence, teacher performance is the degree of effectiveness and efficiency with which lecturers provide qualitative education to the citizenry (Manga, 2004).

Generally, it is agreed that adequate and prompt payment of salary is necessary if lecturers in tertiary institutions have to afford their basic needs and come up with a better performance. Consequently, most of the employees including lecturers, value work in accordance with how much they will realize from it.

The influence of lecturers' accommodations in tertiary institutions on job performance has increasingly become an area of concern and interest. It is vital to note that a good accommodation is necessary if the lecturers, in tertiary institutions have to perform their job effectively. The performance of academic staff depends on the conduciveness of the work environment and the kind of task they handle in a given time frame (Abu-Addissamad, 2013).

Objectives of the Study

The study sought to find out the level of:

1. adequacy of lecturers' salary in state owned tertiary institutions in Sokoto State;

2. adequacy of lecturers' accommodation and saving facilities in state owned tertiary institutions in Sokoto State;
3. lecturers' job performance in state owned tertiary institutions in Sokoto State.

Research Questions

This study was guided by the following Research Questions:

1. what is the Level of Adequacy of Lecturers' Salary in State Owned Tertiary Institutions in Sokoto State?
2. what is the Level of Adequacy of Lecturers' Accommodation in State Owned Tertiary Institutions in Sokoto State?
3. what is the Level of Adequacy of Lecturers' Job Performance in State Owned Tertiary Institutions in Sokoto State?

Research Hypotheses

The following Null Hypotheses were formulated and tested:

- H₀₁.** there is no Significant Relationship between Level of Adequacy of Lecturers' Salary and Job Performance in State-Owned Tertiary Institutions in Sokoto State;
- H₀₂.** there is no Significant Relationship between Level of Adequacy of Lecturers' Accommodation and Job Performance in State-Owned Tertiary Institutions in Sokoto State.

Methodology

This study adopted a correlational survey design. The population of the study comprised of 2542 individuals from 10 state-owned tertiary institutions in Sokoto State. A sample of 333 participants selected using proportionate and random sampling technique. Two sets of Instruments were used for data collection, Lecturers Welfare Rating Scale (LWRS) and Lecturers Job Performance Rating Scale (LJRS). The instruments were validated by three. Pilot study was conducted to check the reliability of the instruments. After test-retest, the data was compared using Pearson Product Moment Correlation Coefficient (PPMCC). A reliability indices of 0.83 and 0.76 was obtained respectively. The data was collected through the distribution of the instruments by the researchers and their research assistants. The data was also

analyzed using descriptive statistics and inferential statistics. The mean score serves as a tool used to analyze the responses of the participants to the rating scale with the decision mean at 3.00 indicating moderate level of agreement. Furthermore, any mean score that was less than 3.00 was rejected. The null hypotheses were analyzed using Pearson Product Moment Correlation Co-Efficient at 0.05 level of significant. The Statistical Package for Social Science (SPSS) was used to process the data obtained.

This section presents the results of the study based on the respective research questions and hypotheses:

RQ1: What is the Level of Adequacy of Lecturers' Salary in State Owned Tertiary Institutions in Sokoto State?

The respondents' responses on this research question 1 were presented in table 1 as follows:

Table 1: Responses on the Level of Adequacy of Lecturers' Salaries in State Owned-Tertiary Institutions in Sokoto State, Nigeria

S/N	Lecturers' Salary	F	%	Level
1	Lecturer's salary is adequate for them to properly feed their families.	224	70%	VLL
2	Lecturers' salary is adequate for them to afford decent clothing.	224	70%	VLL
3	Lecturers' salary is adequate for them to build personal houses.	231	72%	VLL
4	Lecturers' salary is adequate for them to afford their children's school fees.	205	64%	VLL
5	Lecturers' salary is adequate for them to afford the payments of electricity bills.	192	60%	LL
6	Lecturers' salary is adequate for them to afford the payment of DSTV and mobile phone data subscriptions.	205	64%	VLL
7	Lectures' salary is adequate for them to cater for their travelling expenses.	199	62%	LL
8	Lectures' salary is paid promptly without delay.	211	66%	HL
9	Lectures' salary normally increases when they get promoted to the next level.	166	52%	LL
	Mean	205	64%	VLL

Result from the table 1 indicates that, the majority view of 64% with a grand rating of 1.0 reveals that, the level of adequacy of lecturers' salary in state owned tertiary institutions in Sokoto State was low and unsatisfactory. This unsatisfactory level was reflected in items 1,2,3,4,5, 6 and 9. It was found that Lecturer's salary was not adequate for them to properly feed their families,

afford decent clothing, build personal houses, pay children school fees, pay electricity bill and mobile phone data. Also, the result further revealed that lecturers' salary was not adequate for them to cater for their travelling expenses and the pay does not increase when they get promoted to the next level, but only that they are paid promptly as indicated in item 8.

Research Question Two

RQ2: What is the Level of Adequacy of Lecturers' Accommodations in State-Owned Tertiary Institutions in Sokoto State?

The respondents' responses on research question 2 were presented in table 2 as follows:

Table 2: Responses on the Level of Adequacy of Lecturers' Accommodations in State Owned Tertiary Institutions in Sokoto State, Nigeria

S/N	Lecturers' Accommodations	f	%	Level
1	There is provision of adequate housing accommodation for the lecturers.	166	52%	LL
2	There is provision of adequate office accommodation for the lecturers.	192	60%	LL
3	Every lecturer is entitled to well-furnished and equipped house and is being given to them.	211	66%	VLL
4	Every lecturer is entitled to an office within the institution's environment is being given to them.	179	56%	LL
5	Allocation of staff offices are done with fairness without any discrimination.	173	54%	LL
6	There is well furnished common room for lecturers within the institution.	166	52%	LL
	Mean	179	56%	LL

Result from the table 2 indicates that, the majority view of 56% with a grand rating of 2.0 reveals that, the level of adequacy of lecturers' accommodations in state owned tertiary institutions in Sokoto State was low and unsatisfactory. This unsatisfactory level was reflected in items 1, 2, 3, 4, 5, and 6. It was found that in terms of accommodation, there was no provision of adequate housing and adequate office accommodation for lecturers and allocation of staff offices are done with discrimination and sentiment. Also, there is no well-furnished common room for lecturers within the institution.

Research Question Three

RQ3: What is the Level of Lecturers' Job Performance in State Owned Tertiary Institutions in Sokoto State?

The respondents' responses on research question three were presented in table 3 as follows:

Table 3: Responses on the Level of Adequacy of Lecturers' Job Performance in State Owned Tertiary Institutions in Sokoto State

S/N	Item Statements	F	%	Level
1	Lecturers attend their classes regularly and punctually	244	70%	VHL
2	Lecturers do start their lectures with good introduction.	244	70%	VHL
3	Lecturers in my institution publish articles locally in their departments and faculty/school-based journals.	231	72%	VHL
4	Lecturers publish quality articles in their national association journals and book of readings.	237	74%	VHL
5	Lecturers do offer consultancy services to members of the community.	205	64%	HL
6	Lecturers use to be members and have responsibilities in different community development for a.	244	70%	VHL
7	Lecturers in my institutions help students assigned to them for project supervision to formulate suitable and researchable topics.	231	72%	VHL
8	Lecturers assess students practical teaching based on the approved teaching practice supervision format without bias or sentiment fields that are peer reviewed for use at tertiary level of education	244	70%	VHL
	Mean	232	70%	VHL

The grand majority view of 71% with a grand rating of 5.0 in the table 3 shows that, the level of lecturers' job performance in state owned tertiary institutions in Sokoto State was rated very high and satisfactory. This is affirmed in items 1,2,3,4,5,6,7, and 8, It was found that in terms of lecturers job performance, lecturers attend their classes regularly and punctually, do start their lectures with good introduction, use to publish articles locally in their departments and faculty/school-based journals, they do offer consultancy services to members of the community, they use to be members and have responsibilities in different community development fora Also, lecturers publish quality articles in their national association journals and book of readings, they do help students assigned to them for project supervision to formulate suitable and researchable topics, lecturers assess students practical

teaching based on the approved teaching practice supervision format without bias or sentiment fields that are peer reviewed for use at tertiary level of education, Lecturers use to visit all the students assigned to them for SIWES supervision, and lecturers promptly prepare examination questions and marking guide.

Hypotheses Testing

In this section, three null hypotheses were tested using Pearson's Product Moment Correlation Coefficient. Each hypothesis was tested at 0.05 alpha level presented and analysed in tabular form.

H₀₁: There is no Significant Relationship between Adequacy of Lecturers' Salary and Lecturers' Job Performance in State-Owned Tertiary Institutions in Sokoto State.

This hypothesis was tested by subjecting the adequacy of lecturers' salary and level of lecturers' job Performance scores to a Pearson r-test analysis as shown in the table below.

Table 4: Responses on the Relationship Between the Level Adequacy of Lecturers' Salaries and Job Performance in State-Owned Tertiary Institutions in Sokoto State, Nigeria

Variables	N	Mean	SD	Df	r-Cal	p-Value	Decision
Lecturers' Salary	320	17.6906	4.85087				
				318	0.002	0.977	H ₀₁ Accepted
Job Performance	320	53.0875	7.44879				

Result from table 4 indicates that, the relationship between adequacy of Lecturers' salary and lecturers' job performance in state owned tertiary institutions in Sokoto State was positive and statistically not significant. Pearson's $r = 0.002$ and the P-Value (0.977) is greater than the level of significance (0.05). This reveals that the null hypothesis, which stated that there is no significant relationship between adequacy lecturers' salary and lecturers' job performance in state owned tertiary institutions in Sokoto State was retained. Therefore, it was concluded that there was no significant relationship between adequacy of lecturers' salary and job performance in state owned tertiary institutions in Sokoto State.

H₀₂: There is no Significant Relationship between Adequacy of Lecturers' Accommodation and Job Performance in State-Owned Tertiary Institutions in Sokoto State.

This hypothesis was tested by subjecting the adequacy of lecturers' accommodation and job performance scores to a Pearson r-test analysis as shown in the table below.

Table 5: Responses on the Relationship Between the Level Adequacy of Lecturers' Accommodation and Job Performance in State Owned Tertiary Institutions in Sokoto State, Nigeria

Variables	N	Mean	SD	Df	r-Cal	p-Value	Decision
Lecturers' Accommodation	320	13.1125	4.62986				
				318	-0.012	0.825	H ₀₃ Accepted
Job Performance	320	53.0878	7.44879				

Looking at the table 5, the result indicates that the Pearson's $r = -0.012$ and $p\text{-value} = 0.825$, this shows that there was positive relationship and statistically not significant. This implies that an increase in the variable of adequacy of lecturers' accommodation was accompanied with an increase in job performance. Furthermore, the result reveals that the P-value (0.825) is greater than the level of significance (0.05). This means that the null hypothesis, which stated that there is no significant relationship between adequacy of adequacy of lecturers' accommodation and performance in state owned tertiary institutions in Sokoto State was retained. Thus, it was concluded that there was no significant relationship between adequacy of adequacy of lecturers' accommodation and performance in state owned tertiary institutions in Sokoto State.

Discussion

The first findings revealed that the level of adequacy of lecturers' salary in state owned tertiary institutions in Sokoto State was rated low by most of the participants as shown in table 3. The finding further revealed that there was no significant relationship between adequacy of lecturers' salary and job performance in state owned tertiary institutions in Sokoto State. This finding disagreed with findings of Adamu and Garba (2019), who reported that there was significant relationship between payment of lecturers' salary and job performance in senior secondary schools in Adamawa state, Nigeria.

The second finding of the study indicates that there was low level of adequacy of lecturers' accommodation in state owned tertiary institutions in Sokoto State. It also revealed that, there was no significant relationship between adequacy of lecturers' accommodation and job performance in state owned tertiary institutions in Sokoto State. This finding agreed with the finding of Cephas, Gibson and Abdulazeez (2021), which indicates that there was low level of lecturers' accommodation in school of Business Federal Polytechnic Bauchi. However, the two researchers disagreed in the view that the level of adequacy of lecturers' accommodation has significant relationship with their performance.

Conclusion

The findings of this study indicate a generally low to moderate level of adequacy across various aspects of lecturers' welfare in state-owned tertiary institutions in Sokoto State. Specifically, lecturers' salaries, was rated very low, while accommodation was rated low. Despite these challenges, the statistical analysis revealed no significant relationship between the adequacy of these welfare components and lecturers' job performance, as all P-values were greater than 0.05. This suggests that while welfare conditions were suboptimal, they might not directly impact job performance in a measurable way, possibly due to other motivating factors or institutional dynamics at play. Nevertheless, the low adequacy ratings highlighted a pressing need for state authorities to improve lecturers' welfare conditions in order to enhance their overall well-being and institutional satisfaction, which may indirectly support better performance and retention in the long term.

Recommendations

1. Salary of the lecturers should be improved by implementation of the appropriate scale and increment as approved by the federal government. This will make them have an improved job performance.
2. State government should provide the lecturers with adequate housing and office accommodation in order to make the job attractive and motivate them for a better performance.

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Impact of Administrative Efficiency on Staff Salary, Promotion and Transport Service in State Owned Tertiary Institutions in Sokoto State, Nigeria

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Abstract

This study assessed the impact administrative efficiency on staff salary, promotion, and transportation in state owned tertiary institutions in Sokoto State. The study was guided by four objectives, four research questions and three null hypotheses. The study adopted a correlational design. The population of the study consisted of 4287 subjects. 357 participants were drawn using Research Advisors (2006) as sample of the study. Purposive sampling technique was employed in selecting the respective institutions, and proportionate sampling technique was used in selecting the participants from the selected institutions. Two sets of self-designed instruments were used for data collection and these are, Staff Welfare Rating Scale (SWRS) and Administrative Efficiency Rating Scale (AERS.). The reliability of the instruments was obtained using test-re-test method and reliability indexes of 0.88 and 0.78, were obtained. The study found among others that the extent of staff salary in state-owned tertiary institutions in Sokoto state was low. The research concludes that there was low extent of adequacy of staff salary in state-owned tertiary institutions in Sokoto State. It is thus recommended that, the management of State-Owned Tertiary Institutions should ensure regular review of staff salary scale by the state governments in order to ensure adequate staff salary in state-owned tertiary institutions.

Keywords: Lecturer's Welfare, Administrative efficiency, Salary, Promotion, State Tertiary Institutions

Introduction

Efficiency is how well an activity or operation is performed. In other words, efficiency measures how well an organization does what it does. Hence, administrative efficiency is how well an administrator carryout an activity or operation for the purpose of attaining organizational goals. Administrators' competence is a major determinant of efficiency of any institutions (Musa, 2023).

Abubakar (2013), stated that Salary and Fringe Benefits are one of the universal and of course the basic incentive in work situation is money. Money is important for the procurement of basic necessities of life. Monetary rewards in a tertiary education system are earned through salaries or wages and allowances such as peculiar allowances, housing allowances, shifting allowances, overtime allowances and responsibility allowances, other allowances include transport allowance, medical allowance, leave grants, gratuity and pension allowances, inducement allowances etc.

Promotion in any organization, tertiary institutions inclusive, wants to see a change for the better in their place of work. This comes through promotion. Promotion brings more money, recognition and status and thus, puts new life in the worker and expands his/her knowledge and skills while he/she strives harder to be effective in his/her new task. Therefore, the motivating effect of promotion is very high.

Faith (2018), conducted a study and investigated Staff Welfare and Secretaries' Efficiency in Tertiary Institutions in Rivers State. Descriptive survey design was adopted for the study. The study was carried out in Rivers State in Nigeria. This study is related to the current study because the focus area of the study is Staff Welfare and Secretaries Efficiency in Tertiary Institution in Rivers State only while the current study investigated the relationship between staff welfare and administrative efficiency in state owned tertiary institutions in Sokoto State.

Nkedishu (2022), conducted research on administrative efficiencies and teacher productivity in Delta State secondary schools, Nigeria. Three research questions and hypotheses gave the study a direction. This study is highly related to the current study because the focus area of the study is on administrative efficiencies and teacher productivity in Delta State secondary

schools, Nigeria, while the current study investigated the Relationship between Staff Welfare and Administrative Efficiency in State-Owned Tertiary Institutions in Sokoto State. The two studies are different in terms of population.

Objectives of the Study

The objectives of the study were to:

1. find out the extent of adequacy of staff salary in state owned tertiary institutions in Sokoto State;
2. find out the extent of adequacy of staff promotion in state owned tertiary institutions in Sokoto State;
3. find out the level of administrative efficiency in state owned tertiary institutions in Sokoto State.

Research Questions

This study was guided by the following research questions:

1. what is the extent of adequacy of staff salary in state-owned tertiary institutions in Sokoto State, Nigeria?
2. what is the extent of adequacy of staff promotion in state-owned tertiary institutions in Sokoto State Nigeria?
3. what is the level of administrative efficiency in state-owned tertiary institutions in Sokoto State Nigeria?

RESEARCH HYPOTHESES

This study was guided by the following Research Hypotheses:

H₀₁: there is no significant relationship between adequacy of staff salary and administrative efficiency in state-owned tertiary institutions in Sokoto State, Nigeria.

H₀₂: there is no significant relationship between adequacy of staff promotion and administrative efficiency in state-owned tertiary institutions in Sokoto State, Nigeria.

Methodology

This study employed a correlational research design. The target population consisted of 4287 respondents from 10 state-owned tertiary institutions in Sokoto State. From this population, a sample of 357 respondents were drawn from 7 of the 10 institutions using purposive and random sampling methods. Two self-developed instruments were used to gather data from the selected participants. The first, titled Staff Welfare Rating Scale (SWRS), was designed to assess the welfare of staff and included three sub-variables such as staff salary, promotion and transport service. The second instrument, called Administrative Efficiency Rating Scale (AERS), was also self-constructed and focused on evaluating Level of Administrative Efficiency in State-Owned Tertiary Institutions.

To ensure validity, three experts reviewed the instruments. A pilot study was conducted to assess the reliability of the tools through a test-retest procedure, with results analyzed using the Pearson Product Moment Correlation Coefficient (PPMCC). The reliability coefficients were 0.83 and 0.76 for the two instruments, respectively. Data collection was carried out by the researchers and their assistants through direct distribution of the instruments. The collected data was analyzed using both descriptive and inferential statistical methods. Mean scores were used to interpret participants' responses, with a decision threshold of 3.00; scores below this value were considered as not agreed upon. The null hypotheses were tested using PPMCC at a 0.05 significance level. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS).

Results

RQ1: What is the Extent of Adequacy of Staff Salary in State-Owned Tertiary Institutions in Sokoto State, Nigeria?

The respondents' responses on this research question 1 were presented in Table 1 as follows:

Table 1: Responses on the Extent of Adequacy of Staff Salary in State Owned Tertiary Institutions in Sokoto State, Nigeria

S/N	Staff Salary	F	%	Rating	Extent	Decision
1	Salary is adequate for staff to feed their family.	243	70%	1.0	VLE	Unsatisfactory
2	Salary is adequate for staff to afford decent clothing.	243	70%	1.0	VLE	Unsatisfactory
3	Salary is adequate for staff to build a house.	250	72%	1.0	VLE	Unsatisfactory
4	Salary is adequate for staff to pay school fees of their children.	222	64%	1.0	VLE	Unsatisfactory
5	Staff salary is adequate to pay electricity bills.	208	60%	2.0	LE	Unsatisfactory
6	Staff salary is adequate to pay for satellite and mobile phone data subscriptions.	222	64%	1.0	VLE	Unsatisfactory
7	Staff salary is adequate to cover travelling expenses.	215	62%	1.0	VLE	Unsatisfactory
8	Staff salary is paid promptly without delay.	229	66%	4.0	HE	Satisfactory
9	Staff salary is adequate to save after deducting expenses.	180	52%	2.0	LE	Unsatisfactory
	Mean	222	64%	2.0	LE	Unsatisfactory

Key:

N = 347

Cut-off = 3.0

5.0 = VHE (Very High Extent)

4.0 = HE (High Extent)

3.0 = ME (Moderate Extent)

2.0 = LE (Low Extent)

1.0 = VLE (Very Extent Extent)

Items 1,2,3,4,5, 6 and 9 as shown in the above table, revealed that staff salary was not adequate for them to properly feed their families, afford decent clothing, build personal houses, pay children school fees, pay electricity bill and mobile phone data. Furthermore, the result indicated that staff salary was not adequate for them to cater for their travelling expenses and the pay did not increase when they get promoted to the next rank. However, item 8 revealed that staff were paid promptly which was rated high and satisfactory. Therefore, the extent of adequacy of staff salary in state owned tertiary institutions in Sokoto State was rated low and unsatisfactory by majority of the participants (64%, rating of 1.0).

RQ2: What is the Extent of Adequacy of Staff Promotion in State-Owned Tertiary Institutions in Sokoto State, Nigeria?

The respondents' responses on this research question 2 were presented in table 1 as follows

Table 2: Responses on the Extent of Adequacy of Staff Promotion in State Owned Tertiary Institutions in Sokoto State, Nigeria

S/N	Staff Promotion	F	%	Rating	Extent	Decision
1	There is fairness of promotion among staff.	243	70%	5.0	VHE	Satisfactory
2	There is specific requirements for staff promotion.	250	72%	5.0	VHE	Satisfactory
3	Accelerated staff promotion is based on outstanding performance.	256	74%	5.0	VHE	Satisfactory
4	Many staff benefited from promotion.	235	68%	4.0	HE	Satisfactory
5	Accelerated promotion is based on selected staff.	263	76%	5.0	VHE	Satisfactory
6	All promotions are based on merit without sentiment.	263	76%	5.0	VHE	Satisfactory
7	All promotions are secured as a result of new innovation recorded by a staff.	215	62%	4.0	HE	Satisfactory
8	Promotions are made after extensive evaluation by appointment and promotion committee (A&PC).	236	68%	4.0	HE	Satisfactory
9	Financial support after promotions are attained by the staff.	208	60%	2.0	HE	Unsatisfactory
	Mean	239	69%	4.0	HE	Satisfactory

Key:

N =347

Cut-off = 3.0

5.0 = VHE (Very High Extent)

4.0 = HE (High Extent)

3.0 = ME (Moderate Extent)

2.0 = LE (Low Extent)

1.0 = VLE (Very Extent Extent)

Items 1,2,3,4,5,6,7 and 8 as shown in the above table , indicated that there was fairness in promotion among staff; staff got promoted without any delay, accelerated promotion was based on staff outstanding performance, promotion stagnation was not common in most of the existing tertiary institutions, accelerated promotion was based on staff ability to meet up with the requirements for the promotion, staff promotions were based on merit without any sentiment, promotion are secured as a result of new innovation recorded by the staff and promotions were made after extensive evaluation by appointment and promotion committee (A&PC). On the other hand, financial supports after promotion were not given to the staff as indicated in item 9. Therefore, the extent of adequacy of staff promotion in state owned tertiary

institutions in Sokoto State was rated high and satisfactory by majority of the participants (69%, rating of 4.0).

RQ3: What is the Level of Administrative Efficiency in State-Owned Tertiary Institutions in Sokoto State Nigeria?

The responses on research question four were related to items 1 to 14 of Administrative Efficiency Rating Scale and all responses were collected, analysed and presented in the Table below.

Table 3: Responses on the Level of Administrative Efficiency in State Owned Tertiary Institutions in Sokoto State, Nigeria

S/N	Item Statement	F	%	Rating	Level	Decision
1	School administrator ensure prompt preparation of monthly payroll.	208	60%	4.0	HL	Satisfactory
2	School administrator attend to all staff who have any problem with their payment of salary.	235	68%	4.0	HL	Satisfactory
3	School administrator pursues the promotion process at all stage to logical conclusion.	250	72%	5.0	VHL	Satisfactory
4	School administrator ensures the availability of school buses to transport staff and students to and from the school.	229	66%	4.0	HL	Satisfactory
5	School administrator ensures proper maintenance of school vehicles.	235	68%	4.0	HL	Satisfactory
6	School administrator ensures proper allocation of staff offices within the school.	229	66%	4.0	HL	Satisfactory
7	School administrator does allocate houses to staff in the staff quarters base on merit without any discrimination.	222	64%	4.0	HL	Satisfactory
8	School administrator ensures frequent payment of allowances to staff without any unnecessary delay.	236	68%	4.0	HL	Satisfactory
9	School administrator does not encourage underpayments of staff allowances.	236	68%	4.0	HL	Satisfactory
	Mean	232	67%	4.0	HL	Satisfactory

Key:

N =347

Cut-off = 3.0

5.0 = VHE (Very High Extent)

4.0 = HE (High Extent)

3.0 = ME (Moderate Extent)

2.0 = LE (Low Extent)

1.0 = VLE (Very Extent Extent)

Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11 as shown in the above table, indicated that school administrator ensured prompt preparation of monthly payroll, school administrator attended to all staff who have any problem with their payment of salary, school administrator pursued the promotion process at all stage to logical conclusion, school administrator ensured the availability of school buses to transport staff and students to and from the school, school administrator ensures proper maintenance of school vehicles, school administrator ensures proper allocation of staff offices within the school, school administrator did not allocate houses to staff in the staff quarters based on merit without any discrimination, school administrator ensured frequent payment of allowances to staff without any unnecessary delay, school administrator did not not encourage underpayments of staff allowances, school administrator ensured proper management of staff cooperative within the school, and school administrator approved the staff request who applied for leave. Therefore, the level of adequacy of administrative efficiency in state owned tertiary institutions in Sokoto State was rated high and satisfactory by majority of the participants (67%, rating of 4.0).

Hypotheses Testing

In this section, three null hypotheses were tested using Pearson's Product Moment Correlation Coefficient. Each hypothesis was tested at 0.05 alpha level presented and analysed in tabular forms.

H₀₁: There is no Significant Relationship Between Adequacy of Staff Salary and Administrative Efficiency in State-Owned Tertiary Institutions in Sokoto State.

Hypothesis one related to items 1 to 9 of Section A of the Staffs' Welfare Rating Scale and items 1 to 11 of Administrative Efficiency Rating Scale. This hypothesis was tested by subjecting the adequacy of staff salary and level of administrative efficiency scores to a Pearson r-test analysis as shown in the Table below.

Table 4: Relationship Between the Extent of Adequacy of Staff Salary and Administrative Efficiency in State Owned Tertiary Institutions in Sokoto State

Variables	N	Mean	SD	Df	r-Cal	p-Value	Decision
Staff Salary	347	18.1239	5.20273				

				345	-0.009	-0.873	H ₀₁ Accepted
Administrative Efficiency	347	47.0317	8.89513				

Result from the above Table indicates that, the relationship between adequacy of staff salary and administrative efficiency in state owned tertiary institutions in Sokoto State was negative and statistically not significant. Pearson’s $r = -0.009$ and the P-Value (0.873) is greater than the level of significance (0.05). This reveals that the null hypothesis, which stated that there is no significant relationship between adequacy of staff salary and administrative efficiency in state owned tertiary institutions in Sokoto State was retained. Therefore, it was concluded that there was no significant relationship between adequacy of staff salary and administrative efficiency in state owned tertiary institutions in Sokoto State.

H₀₂: There is no Significant Relationship Between Adequacy of Staff Promotion and Administrative Efficiency in State-Owned Tertiary Institutions in Sokoto State.

Hypothesis two related to items 10 to 18 of Section A of the Staffs’ Welfare Rating Scale and items 1 to 11 of Administrative Efficiency Rating Scale. This hypothesis was tested by subjecting the adequacy of staff promotion and level of administrative efficiency scores to a Pearson r-test analysis as shown in Table below.

Table 5: Relationship Between the Extent of Adequacy of Staff Promotion Administrative Efficiency in State Owned Tertiary Institutions in Sokoto State

Variables	N	Mean	SD	Df	r-Cal	p-Value	Decision
Staff Promotion	347	30.7578	6.66164				
				345	-0.017	0.759	H ₀₂ Accepted
Administrative Efficiency	347	47.0317	8.89513				

As shown in the above Table, the result shows that the Pearson’s $r = -0.017$ and p-value = 0.759, this indicates that there was negative relationship and statistically not significant. This suggests that an increase in the variable of adequacy of staff promotion was accompanied by decrease in administrative efficiency. Similarly, the result also indicates that the P-value (0.759) is greater than the level of significance (0.05). This means that the null

hypothesis, which stated that there is no significant relationship between adequacy of staff promotion and administrative efficiency in state owned tertiary institutions in Sokoto State was accepted. Therefore, it was inferred that there was no significant relationship between adequacy of staff promotion and administrative efficiency in state owned tertiary institutions in Sokoto State.

Summary of Findings

1. There was low level of adequacy of staff salary in state owned tertiary institutions in Sokoto State (64%, rating of 2.0). It was also revealed that there was no significant relationship between adequacy of staff salary and administrative efficiency in state owned tertiary institutions in Sokoto State (P-Value of $-0.873 > 0.05$).
2. There was high extent of staff promotion in state owned tertiary institutions in Sokoto State (69%, rating of 4.0). It further revealed that, there was no significant relationship between adequacy of staff promotion and administrative efficiency in state owned tertiary institutions in Sokoto State (P-Value of $0.759 > 0.05$).

Discussion

The first findings indicates that most of the participants rated the extent of adequacy of staff salary in state owned tertiary institutions in Sokoto State to be low extent. This revealed that staff salary was not enough for them to properly feed their families, buy decent clothing, own personal houses, settle their children school fees, pay electricity bill and subscribe mobile phone data. Similarly, the result indicated that staff salary was not adequate for them to take care of their travelling expenses and the salary did not increase when they get promoted to the next level. However, it further revealed that staff were paid promptly. The finding also revealed that there was no significant relationship between the adequacy of staff salary and administrative efficiency in state owned tertiary institutions in Sokoto State. Therefore, even though the extent of staff salary was low in state owned tertiary institutions in Sokoto state, administrative efficiency tend to be high, this is because it is not administrators' responsibility to provide staff with salary, but to ensure prompt preparation of monthly payroll and to attend to all staff who have any problem with their salary, administrators in tertiary institutions were found doing so as it is revealed in table 10. This agrees with Faith (2018), who reported that

there was a no significant relationship between staff remuneration and secretaries' administrative efficiency in tertiary institutions in Rivers State. In consonance to the above findings, it is therefore noted empirically that employees were usually motivated and excel in their job when they were paid good salaries as at when due.

The second findings revealed that there was high extent of staff promotion in state owned tertiary institutions in Sokoto State. This indicated that there was fairness in promotion among staff; staff do get promoted without any delay, accelerated promotion was based on staff outstanding performance, promotion stagnation was not common in most of the existing tertiary institutions, accelerated promotion was based on staff ability to meet up with the requirements for the promotion, staff promotions were based on merit without any sentiment, promotion was secured as a result of new innovation recorded by the staff and promotions were made after extensive evaluation by appointment and promotion committee (A&PC). On the other hand, financial supports after promotion were not given to the staff. The finding also revealed that there was no significant relationship between the adequacy of staff promotion and administrative efficiency in state owned tertiary institutions in Sokoto State. Therefore, even though the extent of staff promotion was high in state owned tertiary institutions in Sokoto state, administrative efficiency was also high, this indicates that promotion is an indicator of administrative efficiency even though the result indicated the relationship between the two variables was not statistically significant. This finding disagrees with Aji (2021), who reported that, that there was significant relation between promotion and academic staff development? The study indicated that the state government did not pay the promotion benefits of academic staff in the state higher education and this has a significant impact on academic staff development in state higher educational institutions

Conclusion

The findings of this study revealed a generally low extent of adequacy in various aspects of staff welfare particularly in the areas of salary and transport service, within state-owned tertiary institutions in Sokoto State. Promotion was found to be high. their adequacy did not translate into significant improvements in administrative efficiency.

Recommendations

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

3. The management of state tertiary institutions should review the salary scale of staff in state tertiary institutions on periodical basis so that it can tally with any economic situation.
4. In order to realize administrative efficiency state government should ensure that staff are promoted in due time and financial support after promotion are attained by the staff. This enables them cooperate with the administrative and management policies.

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Relationship between Staff Salary, Staff Promotion and Managerial Effectiveness in Higher Educational Institutions in Sokoto State, Nigeria

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Abstract

The study investigated the relationship between Staff salary, Staff Promotion and Managerial Effectiveness in higher educational institutions in Sokoto State. Similarly, two research objectives and two research hypotheses were raised respectively to guide the study. Furthermore, correlational survey research design was used in this study. Moreover, the study used population of three thousand nine hundred and Fourty eight (3,948) academic and nonacademic staff across ten higher educational institutions in Sokoto State, out of which three hundred and fifty (350) were sampled using research advisor (2006). Two sets of instruments were used to collect data for the study which include: Staff salary and Managerial Effectiveness Assessment Questionnaire (SSPMEAQ) with reliability index of 0.86 while staff salary and Managerial Effectiveness Assessment Questionnaire (SSPMEAQ) has reliability index of 0.84. All the instruments were validated by experts and were said to have content validity. Hypotheses one and two were analysed using Pearson Product-Moment Correlation. The findings of the study revealed that there is significant relationship between promotion of staff and managerial effectiveness in the higher educational institutions. Similarly, strong positive relationship was observed between Staff salary and managerial effectiveness. It was concluded that there is positive relationship between staff salary, staff promotion and managerial effectiveness in higher educational institutions in Sokoto State; moreover hypotheses was tested using Pearson Product Moment Correlation Coefficient (PPMC) therefore, it was recommended that the higher educational institutions should develop salary packages and staff salary increment to ensure staff members received their expectations for managerial effectiveness in higher educational institutions. Clear transparent criteria and requirements for promotion should be highlighted for managerial effectiveness in higher educational institutions.

Keywords: Staff, salary, promotion, managerial, Effectiveness and Institutions

Introduction

Education is the process of learning from birth to death. Education has been recognized as the foundation of development in any country worldwide (Unagha, 2018). A higher Educational Institution encompasses various types of Education delivered in Postsecondary institutions of learning and usually awarding, at end of a course or study, a named degree, diploma, or certificate of higher studies.

As we have been told since the beginning of time that we will eat from our sweat salaries and wages are the most crucial measures for managerial success (Chukwud *et al.*, 2012). The primary motivation for taking up a paid position is the ability to support oneself through a salary or wage. Reasonable salaries must be paid immediately and on time, or as soon as they are due. Similarly, the institution's payment schedule for such payments should be transparent to the employees. Once more, there needs to be some consistency in how these salaries and earnings are distributed to the employees. The management must take into account elements including the cost of living, the institution's financial capacity, and others when determining staff salary (Chukwudi *et al.*, 2012).

Similarly, the practice of rewarding institutional staff in accordance with approved policy and procedures is known as salary and wage management (Blumberg & Pringle, 2019). Monitoring and reviewing every employee's remuneration to make sure they are being paid fairly, both in comparison to other employees of the same institution and to the market as a whole, is an essential part of an effective institution's salary and wage management policy. Similar to how Blumberg & Pringle (2019) regarded salary and wage management, larger organizations are often more likely to handle it through a distinct department as it is often an integral function of higher educational institutions.

Rossberg & Friss (2014), described Promotion as the advancement of an employee to an office or position of higher rank on the ground of merit. Such merit is assessed partly, but only partly on the character and efficient performance of the employee in his current position. More importantly, promotion is based on the assessed overall ability and competence for the higher post, by reference to the overall requirements of the post. Any elevation of a staff member to a rank of higher status, which does not meet these

minimum requirements, shall be deemed to be justified only on the grounds that, the employee has been previously under graded by reference to his qualifications, experience or ability (Sachane *et al.*, 2018).

The Promotions of Academic staff should be based on Evidence of effective teaching, Evidence of scholarly research publication in learned journals in the candidate's field, Evidence of effective service to the College, the Department and the Community and Evidence of good character, loyalty to the Institution as well as personal integrity (Sachane *et al.*, 2018).

The non-academic staff on the other hand should be promoted on the basis of efficiency, competence, effectiveness, ability to take additional responsibilities, experience, special aptitudes, initiative and personal integrity. Similarly Notional Promotion of Staff on Leave of Absence, Secondment to other public service, approved Leave or on special assignment, who falls within the promotion field of selection shall be granted notional promotion, if they are judged to be worthy of promotion. The Accelerated Promotion, A promotion shall be deemed to be accelerated promotion, where it is effected before the employee has spent the minimum number of years on his salary scale from which he is advancing and has exhibited exceptional quality in character and special capability in his/her administrative/academic duty. No representation for accelerated promotion shall be entertained (Rossberg & Friss, 2014).

Similarly, managerial effectiveness perceived a positive response to management efforts and actions with the intention to accomplish stated goal (Akomolafe 2020). Moreover, managerial effectiveness is a product of series of complex nested relations and interaction pattern (Cammock *et al.*, 2020). A management capacity to forecast problems beforehand shows itself as a result of the characteristics and behaviors in his personal relationships and consulting criteria in leading group. Furthermore, Managerial effectiveness requires a balance of skills among many dimensions and parameters which influenced to a different degree by managers (Analoui 2017). The balance of skills includes not only a series of quality behaviors but also many personality traits as a manager (Cammock *et al.*, 2020). Considering the statement above, management supposed to be in their right direction. As a manager for managerial effectiveness there is need to provide staff with promotion, salary, leave grant, passage and transport, advances, allowances, retirement and

pension, accommodation, medical attention, discipline, reward for outstanding services and miscellaneous to every staff (UDUS, 2021).

Akinbode (2021), described managerial effectiveness as the ability to plan, organize, coordinate, motivate, control and have a positive influence on organizational goals. Wang (2016) identified eight different indicators to measure managerial effectiveness, namely supporting, caring, fairness, engaging, disciplined, selfless, responsible and knowledgeable. Based on the description above, it can be synthesized that managerial effectiveness is the accuracy of the actions of a manager in achieving work goals using methods or means and potential, with indicators: manage and lead, interpersonal relations, knowledge and initiative, orientation of success, and contextual independence. It is a major competitive advantage for any organization this is why competent and efficient managers are sought after, and companies that have such managers try their best to retain them. Managerial effectiveness is defined as the ability of a manager to carry out the activities required of his position while achieving the results both current and in terms of developing further potential' (Gupta, 2019). Indeed, Managerial Effectiveness is contingent upon the combination of personal, organizational and environmental factors (Analoui, 2019). A key element that influences Managerial Effectiveness at the workplace is the set of work values.

Unfortunately, School managers in Nigerian higher educational institutions and by extension Sokoto State have not sufficiently identified the role of managers and how it can lead to managerial effectiveness. Therefore, there is need to investigate the relationship between staff salary, staff promotion and managerial effectiveness in higher educational institution in Sokoto state.

Ideally, to bring about good working conditions of service for influencing effective management of higher institution of learning, the school management ought to be providing regular promotion of staff, leave grant, passage and transport, advances, allowances, retirement and pension, accommodation, medical attention, discipline, reward for outstanding services and miscellaneous to every of their staff in order to have managerial effectiveness.

The problems that make the researcher to embark on this study comprise: inadequate Staff motivation, late staff Promotion, and inadequate staff accommodation, problem of salary, inadequate professional development, and insufficient welfare packages for the staff of higher educational institutions in Sokoto State.

The managers who are running the system are receiving variety of criticisms, including that they are unqualified, redundant, lazy, unreliable, and careless about their work. In most cases, these criticisms may be attributed to the poor caliber of the management. Many of these critics make the assumption that the majority of these managers are either not properly trained for the job or intentionally threw away their acquired skills and attitude.

Salary is the process of compensating an organisation's employees in accordance with accepted policy and procedures. An important component of a successful organizations' is monitoring and evaluating all employees salary to ensure that they are being paid appropriately, both with respect to others in the same organization and to the marketplace as a whole. Salary is often an integral function of the organisation's human resources department, but in general, the larger the organization, the more likely it is that it will be handled by a separate department (Chukwudi *et al.*, 2012).

According to Sachane *et al* (2018) Promotion highlights a worker's value to the institution while also highlighting his value to the outside world. He further stated that, promotions result in management effectiveness when a worker advances up a ladder of promotions based on seniority and is rewarded with a higher pay rate as a result. The best results, on the other hand, cannot be produced by promoting a person within the organization, according to Boateng and Hsieh's (2019) theory that promotion is not an incentive mechanism. The failure rate is higher when employees are hired from outside than when they are promoted from inside (Boateng and Hsieh's 2019). Collins *et al.* (2018), is observed to have less of an impact on employee attitudes than wage rises as a result of promotion. Boateng's and Hsieh's (2019) Employees who are dissatisfied with the promotion chances that are available to them are more likely to leave the company. Rossberg's & Hsieh's (2014) research, an employee's likelihood of progression correlates positively with their level of managerial effectiveness.

Objectives of the study

The study is to examine the:

1. Relationship between staff promotion and managerial effectiveness in Higher Educational Institutions in Sokoto state.
2. Relationship between staff salary and managerial effectiveness in Higher Educational Institutions in Sokoto state.

Research Hypotheses

Based on the objectives of the study, the following hypotheses are tested at 0.5 level of significance.

H0₁: There is no significant relationship between staff salary and managerial effectiveness in higher Education Institutions in Sokoto state.

H0₂: There is no significant relationship between promotion of staff and managerial effectiveness in higher Education Institutions in Sokoto state.

Methodology

The study used correlational survey research design. The target population comprised all higher educational institutions academic and nonacademic staff particularly higher educational institutions in Sokoto state. The total population is 3,948 sources from ministry for higher education Sokoto, Sokoto State which consist all ten (10) higher educational institutions in Sokoto State. Two forms of sampling techniques were used. Stratified sampling techniques and proportionate sampling technique. Stratified sampling was used to distribute the sample to each stratum for fully representation in the study. While proportionate was used in distributing the sample to each institution based on its proportionate contribution to the population of the study. of 350 respondents were Sampled out of 3,948 staff of higher educational institutions both academic and non-academic, the researcher used 350 as the sample for the study which determined by Research Advisor (2006) at 95% confidence level.

Two research instruments were used for this study which comprises:

Staff salary and Managerial Effectiveness Assessment Questionnaire (SSAMEAQ): to measure the relationship between salary and managerial effectiveness in higher educational institutions in Sokoto State with content validity after scrutiny by experts in the department of educational management Sokoto state University, Sokoto and reliability index of 0.86 using test – retest method. This was considered high enough for use in this research. Staff promotion and Managerial Effectiveness Assessment Questionnaire (SPMEAQ): to measure the relationship between staff promotion and managerial effectiveness in higher educational institutions in Sokoto state with

content validity after scrutiny by expert in the department of Educational Management, Sokoto State University, Sokoto and reliability index of 0.84 using test – retest method. This was considered high enough for use in this research.

Results

This section presents the result analysis based on the research hypotheses postulated as follows:

1. There is no significant relationship between promotion of staff and managerial effectiveness in higher educational institutions in Sokoto State.
2. There is no significant relationship between staff salary and managerial effectiveness in higher educational institutions in Sokoto State.

Table 1: Relationship between promotion of staff and managerial effectiveness

	N	Mean	Std. Dev.	r-value	P-value	Decision
Promotion of staff	350	2.85	0.511	0.95	0.00	H ₀₁ rejected
Managerial effectiveness	350	2.79	0.278			

α - value = 0.05

Table 1: Shows significant relationship between promotion of staff and managerial effectiveness in Higher Educational Institutions in Sokoto State. The, p-value of 0.00 was less than α - value of 0.05 ($p < \alpha$). That implies that, there was a strong positive relationship between promotion of staff and managerial effectiveness in higher Educational Institutions in Sokoto. In view of this result, the research hypothesis which says there is no significant relationship between promotion of staff and managerial effectiveness in higher Educational Institutions in Sokoto state is here by rejected.

H₀₂: There is no significant relationship between staff salary and managerial effectiveness in higher Education Institutions in Sokoto state.

Table 2: Relationship Between Staff Salary and managerial effectiveness

	N	Mean	Std. Dev.	r-value	P-value	Decision
Staff Salary	350	2.92	0.414	0.31	0.00	H ₀₂ rejected
Managerial effectiveness	350	2.38	0.278			

α - value= 0.05

Table 2: Shows significant relationship between Staff Salary and managerial effectiveness in higher Educational Institutions in Sokoto State. The result showed that, p-value of 0.00 is less than α - value of 0.05 ($p < \alpha$). That suggests that, there is a low positive relationship between promotion of staff and managerial effectiveness in higher Educational Institutions in Sokoto State. In view of this result, the research hypothesis which says there is no significant relationship between promotion of staff and managerial effectiveness in higher Educational Institutions in Sokoto state is here by rejected.

Discussion

Findings of the study revealed that there is a significant relationship between promotion of staff and managerial effectiveness in higher Education Institutions in Sokoto state. This finding is in line with the findings of (Adamu, *et al.*, 2019) who conducted a study, on the relationship between Conditions of Service and Teachers' Job Performance in Senior Secondary Schools in Adamawa State, Nigeria. The finding indicated that there was positive relationship between Conditions of Service and Teachers' Job Performance in Senior Secondary Schools in Adamawa State. This finding also is in line with the findings of Musa and Kwashabawa who conducted a research on Staff Conduct in Relation to Students and Managerial effectiveness In Federal Universities in the North east zone, Nigeria. It was found that there was significant positive relationship between staff conduct in relation to students and managerial effectiveness in federal universities in North east Zone, Nigeria.

The study also found that, there is a significant relationship between staff salary and managerial effectiveness in higher Education Institutions in Sokoto state. These findings agreed with that of Olowoselu and Muritala (2018) who conducted a research on factors inhibiting effective management of Tertiary Educational institutions in Kwara State Nigeria. Their findings revealed that lack of funding hampers the effective management of Tertiary Education in Kwara State Colleges of Education. This finding is in line with the findings of Musa and Manga (2023) who conducted a research on Management of tortious liability of trespass to person and administrative effectiveness in state owned tertiary Educational institutions in Borno State, Nigeria. The findings of the study revealed that there is high extent of management of tort of trespass to person in Borno State owned tertiary educational institutions as well as moderate level of administrative effectiveness. And also there is significant

positive relationship between management of tort of trespass to person and administrative effectiveness in state owned tertiary educational institutions in Borno State, Nigeria.

Conclusion

The study concludes that there is a significant relationship between staff promotion and managerial effectiveness in higher educational institutions in Sokoto State. Similarly, there is significant relationship between staff salary and managerial effectiveness in higher educational institutions in Sokoto state. At 0.05 level of significant.

Recommendations

Based on the findings and in line with the conclusions drawn, the following recommendations have been made:

1. It was recommended that the higher educational institutions should develop salary packages and staff salary increment to ensure staff members received their expectations for managerial effectiveness in higher educational institutions.
2. Clear and transparent criteria and requirements for promotion should be highlighted for managerial effectiveness in higher educational institutions.

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Emotional Intelligence as Correlates of Marital Stability among Married Teachers in Sokoto Metropolis, Sokoto State, Nigeria

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Abstract

This study examined Emotional Intelligence as correlates of marital stability among married teachers in Sokoto State. Two research questions corresponding with two objectives and two hypotheses were raised. The design adapted for the study was Descriptive research design. A sample size of three hundred and thirty-three (333) participants was drawn from a population of 2372 married teachers. The instrument used for data collection was adapted questionnaire by Tambawal (2021) titled: Emotional Intelligence, Self-esteem, Communication Style and Marital Success Questionnaire (EISECMSQ). The hypothesis was tested using Pearson Product Moment Correlation, the result obtained shows that there was significant high positive relationship between Empathy and Marital Stability among married teachers in senior secondary schools in Sokoto metropolis. Also, there was significant moderate positive relationship between Social Skills and Marital Stability among married teachers in senior secondary schools in Sokoto metropolis. The study recommended that, Schools and counselling services should provide emotional intelligence training to help married teachers develop self-awareness, empathy, and effective communication skills.

Keywords: Emotional Intelligence & Marital Stability

Introduction

Marriage is a multiplex convention that plays very important role in people's lives, which impact their happiness and overall wellbeing. Marriage is a social and legal union between two people or more that is man and woman or women

which is regulated by customs, law and rules which describe the rules and regulations of partners. On normal circumstances, marital affairs bring unity and love until death or divorce separates them. According to Tambawal (2021) when marriage is taken seriously there is every tendency of saving the world from hatred and cruel as well as reducing the number of physically or mentally patients.

From the above pieces and definitions however, maintaining a successful and fulfilling marital relationship can be challenging, particularly in demanding professions such as teaching. The ability to navigate the complexities of a marital relationship requires various personal attributes, including emotional intelligence.

Emotional Intelligence comprises of interpersonal and intrapersonal skills. Interpersonal skills consist of the ability to understand the feelings of others emphasize, maintain develop social responsibility in other words, intrapersonal skills consist of the ability to understand one's emotion. Therefore, it plays a vantage role in determining life success including marriage. Some of the attributes of emotional intelligence are empathy and social skill.

Empathy the ability to identify and understand the feelings of other people. Emotionally intelligent people can walk in other people's shoes. Knowing what someone is going through help to understand them better. Empathetic people are usually good in managing relationship and associating with others. They avoid jumping into conclusion and they are honest and open minded. (Tambawal, 2021).

Social skill Comfortable interaction is another element of EI. Social skills offer means of interacting with other that help boost productivity, improve relationships and increase one's general quality of life. People with social skill can manage disputes, they are excellent communicators and masters in building and maintain relationship (Ibrahim 2016). Rather than focusing on their own success first, they help other people to develop and shine.

Marital stability According to Tambawal (2021) a healthy and successful marriage is a relationship that makes each partner feels valued, it is the one place that feel the safest in the world. A successful marriage will encourage each partner to grow and become a better person in the relationship. For marriage relationship to be successful there need to be self-respect (Sharon,

2013). She stated that self-respect allows the marriage to hold a basic framework and it is the bedrock of any successful marriage. If one of the partners is lacking self-respect, then possibilities are that there would be no partnership but a dictatorship. Self-respect prevents married couples from finding themselves in a marital relationship of unfaithful behavior and limiting how the couples communicate to each other.

Davis and Oathout (2021), conducted a study in Benue State, Nigeria, to examine the influence of empathy on marital stability among secondary school teachers. The study adopted a descriptive survey design, with a sample of 210 married teachers selected through stratified random sampling. Data were collected using a standardized emotional intelligence scale and a marital stability questionnaire. Findings revealed a significant positive relationship between empathy and marital stability, indicating that teachers with higher empathic tendencies were more likely to maintain harmonious and enduring marriages.

Okeke and Nwankwo (2022) carried out research in Ilorin, Kwara State, to investigate the relationship between empathy and marital harmony among married civil servants. Using a correlational design, the study sampled 250 respondents through simple random sampling. The results showed that empathy strongly predicted marital stability, as individuals with higher empathic concern were better at conflict resolution, communication, and emotional support within marriage. The authors concluded that empathy plays a crucial role in enhancing marital satisfaction and preventing divorce.

Adeoye and Fashola (2021) examined the influence of social skills on marital quality among married civil servants in Enugu State, Nigeria. The study adopted a correlational design with a sample of 230 participants obtained through purposive sampling. Using structured questionnaires, data analysis revealed a significant positive relationship between social skills and marital satisfaction. The findings highlighted that couples with better communication and problem-solving abilities were more capable of sustaining stable marriages.

Abiola and Bello (2022) examined the relationship between social skills and marital stability among married teachers in Sokoto metropolis. The study employed a correlational design with 250 participants selected through stratified random sampling. Findings revealed a significant relationship, as respondents with higher social skills were better at managing marital

challenges and sustaining stable unions. The study concluded that social intelligence is a key factor in achieving marital harmony. Every scholar has his own way of describing the term emotional intelligence that is why there is no one general accepted definition of emotional intelligence. Emotional intelligence having being one of the variables of researcher's interest has been viewed and discussed by different educationists, psychologist, researchers as well as scholars in different ways. It is based on their perceptions of emotional intelligence that brought about different models of the concept. The early theory of emotional intelligence which was described by Salovey & Mayer 1990 explained emotional intelligence as component of Gardner's perspective of social intelligence similar to the so called 'personal' intelligence, emotional intelligence was said to include an awareness of others (Salovey & Mayer 1990). There are basically three models of emotional intelligence (Aliyu, 2018).

Statement of the Problem

Several couples started their marital life very romantic and enjoyable but with time it fades gradually, some may even decide to separate or divorce. Issues like unfaithfulness, intolerance, quarrelling, and abusing each other may arise during the marriage life which make some people became afraid of getting married and doubt if there is any pleasure driven from it. There is an indication that in today's Nigeria, Sokoto in particular, partners are facing many challenges in setting up and maintaining a friendly relationship as well as understanding their partner's feelings. It is perceptible that deficiencies in couple's moral and mental qualities would have negative effect on marital life.

The case of one Yar Buga Shehu of Kanwuri Sokoto South local Government sued her husband to Kanwuri lower Sharia Court with case number CV/2020 demanding for marriage termination due to beating and denial of food because the wife refuse to surrender to his interest of marrying another wife. Also reports from media houses such as the Nation 14 September, 2020 in Tambawal (2021) reported the case of a woman who killed her husband because the man wanted to add another wife due to low emotional intelligence. A case of a woman who appears in a video clip been seriously beating by her husband who happens to be a barrister, the woman was running nicked but the man kept kicking and hitting her, blood all over her face. The woman narrating the story was a civil servant working with the Federal Ministry of Women Affairs. She said the incidence happen on Sunday 17th

December 2023 and he has been doing that for over a year. These plus many cases of marriage dissolution in Sokoto Metropolis are cases of worry and distress to stakeholders.

Research has shown that some married teachers of secondary school with low emotional intelligence finds it very difficult to adjust with this current situation. For example, those that use to have three square meals a day finds it difficult to switch to two times a day because of the economic situation. They easily get annoyed or frustrated because they don't know how to adjust with the life challenges.

The main thrust of the present study, therefore, is to examine emotional intelligence as correlate of marital stability among secondary school teachers in Sokoto Metropolis.

Objectives of the study

This study is set to achieve the following objectives: To find out if relationship exists between:

1. Empathy and marital stability among married secondary school teachers in Sokoto metropolis.
2. Social Skill and marital stability among married secondary school teachers in Sokoto Metropolis.

Research Questions

The study seeks to answer the following research questions:

1. What is the relationship between empathy and marital stability among married secondary school teachers in Sokoto Metropolis?
2. What is the relationship between social skill and marital stability among married secondary school teachers in Sokoto Metropolis?

Research Hypotheses

The following null hypotheses were formulated to guide the study and will be tested at 0.05 level of significance.

1. There is no significant relationship between empathy and marital stability among married secondary school teachers in Sokoto Metropolis.
2. There is no significant relationship between social skill and marital stability among married secondary school teachers in Sokoto Metropolis.

Methodology

Descriptive research design of correlational type was adopted for this study. The population of this study is all married secondary school teachers in Sokoto metropolis. According to Teachers Service Board, Sokoto 2024 there are 2372 married teachers from sixty-nine (69) secondary schools in Sokoto metropolis. The Research Advisors (2006), Table for determining sample size from a giving population was employed and arrived at three hundred and thirty-three (333) samples of participants. The instrument for data collection is adapted from Tambawal (2021) *titled* Emotional Intelligence, Self-esteem, Communication Style and Marital Success Questionnaire (EISECMSQ). To ensure that the instrument: Emotional Intelligence, Self-esteem, Communication Style and Marital Success Questionnaire (EISECMSQ) was validated by three experts in the field of guidance and counselling, their comments and feedbacks were used to produce the final copy of the instrument. However, the instrument was used as a pilot test by the researcher through a test-retest method to obtain the reliability index of 0.75, confirming the instrument reliable enough to generate information for the study. Data collection was personally carried out by the researcher through the help of two research assistance who help in facilitating the process. For data analysis, inferential statistics Pearson Product Moment Correlation (PPMC) was employed to test the two research hypotheses formulated for the study.

Results

Pearson Product Moment Correlation was used to test the formulated hypotheses. Likewise, summary and discussion of the findings will be highlighted under this section.

Hypotheses Testing

This section presented statistical analysis of all the null hypotheses formulated for this study and the null hypotheses were tested one after the other at 0.05 level of significance presented as follows:

Null Hypothesis One: There is no significant relationship between Empathy and Marital Stability among married teachers in senior secondary schools in Sokoto metropolis

In testing null hypothesis one, the responses on Empathy and Marital Stability collected from the selected 333 married teachers in senior secondary schools in Sokoto metropolis, Nigeria were sorted and correlated electronically on SPSS version 23.0 using Pearson Product Moment Correlation (PPMC) and the results are presented in Table 1

Table 1: Pearson's Correlation Coefficient for Relationship between Empathy and Marital Stability of Married Teachers in Senior Secondary Schools in Sokoto metropolis

Variable	N	Mean	Std. Dev	Df	r-Cal	p-Value	Decision
Empathy	333	3.1134	0.8893	331	0.767**	0.001	H ₀₁
Marital Stability	333	3.1989	0.2088				Rejected

Source: Fieldwork work (2025)

Table 1 presents a summary of Pearson correlation performed to establish the degree of relationship between Empathy and Marital Stability of Married Teachers in senior secondary schools in Sokoto metropolis. The results of the analysis $r(331) = 0.767$, $p < 0.05$ revealed that there was significant high positive relationship between Empathy and Marital Stability of Married Teachers in senior secondary schools in Sokoto metropolis. However, since the p -Value of 0.001 is less than 0.05 level of significance, the null hypothesis one (H₀₁) was therefore rejected. This implies that higher levels of Empathy are associated with higher levels of Marital Stability.

Null Hypothesis Two: There is no significant relationship between Social Skills and Marital Stability among married teachers in senior secondary schools in Sokoto metropolis

In testing null hypothesis two, the responses on Social Skills and Marital Stability collected from the selected 333 married teachers in senior secondary schools in Sokoto metropolis, Sokoto metropolis, Nigeria were sorted and

correlated electronically on SPSS version 23.0 using Pearson Product Moment Correlation (PPMC) and the results are presented in Table 2

Table 2: Pearson's Correlation Coefficient for Relationship between Social Skills and Marital Stability of Married Teachers in Senior Secondary Schools in Sokoto metropolis

Variable	N	Mean	Std. Dev	df	r-Cal	p-Value	Decision
Social Skills	333	3.2297	0.5520	331	0.528**	0.001	H ₀₂
Marital Stability	333	3.1989	0.2088				Rejected

Source: Fieldwork work (2025)

Table 2 presents a summary of Pearson correlation performed to establish the degree of relationship between Social Skills and Marital Stability of Married Teachers in senior secondary schools in Sokoto metropolis. The results of the analysis $r(331) = 0.528$, $p < 0.05$ revealed that there was significant moderate positive relationship between Social Skills and Marital Stability of married teachers in senior secondary schools in Sokoto metropolis. However, since the p -Value of 0.001 is less than 0.05 level of significance, the null hypothesis two (H₀₂) was also rejected. This implies that higher levels of Social Skills are associated with moderate level of Marital Stability. In this study, the participating teachers found with higher levels of Social Skills reported moderate level of marital stability which implies that they are considerate, demonstrated moderate communication skills, emotional connections and conflicts resolution skills resulting to stability in their marriage with moderately low risks of marital failure.

Summary of Findings

This study investigated emotional intelligence as correlates of Marital Stability among married teachers in senior secondary schools in Sokoto metropolis. However, 2 research questions were answered and 2 corresponding null hypotheses were tested at 0.05 level of significance and the study found that:

1. There was significant high positive relationship between Empathy and Marital Stability among married teachers in senior secondary schools in Sokoto metropolis.
2. There was significant moderate positive relationship between Social Skills and Marital Stability among married teachers in senior secondary schools in Sokoto metropolis.

Discussion

The findings of the study revealed a significant positive relationship between empathy and marital stability among married teachers in senior secondary schools in Sokoto metropolis. This suggests that teachers who demonstrate higher levels of empathy are more likely to experience harmonious and lasting marriages. Empathy allows couples to recognize, understand, and respond to their partner's emotions, which strengthens communication and conflict resolution. This aligns with Davis and Oathout (2021), who revealed that a significant positive relationship between empathy and marital stability, indicating that teachers with higher empathic tendencies were more likely to maintain harmonious and enduring marriages. Similarly, Okeke and Nwankwo (2022) found that empathy strongly predicted marital stability, as individuals with higher empathic concern were better at conflict resolution, communication, and emotional support within marriage.

The results indicated a significant relationship between social skills and marital stability. This implies that teachers who possess strong interpersonal and communication skills are better equipped to sustain stable marital relationships. Social skills such as active listening, negotiation, and cooperation enable couples to navigate challenges and strengthen mutual respect. This finding is supported by Adeoye and Fashola (2021), who highlighted that couples with better communication and problem-solving abilities were more capable of sustaining stable marriages. Similarly, Abiola and Bello (2022) found that respondents with higher social skills were better at managing marital challenges and sustaining stable unions.

Conclusion

Based on the findings of the study, the conclusion drawn is that the more empathy the couples poses, the higher the stability their marriage will be. Likewise, the higher the social skill, the higher the stability in marriage.

Recommendations

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

1. Schools should integrate emotional intelligence training into pre-marital and marital counselling sessions. Focus particularly on building empathy among teachers.

2. Government should formulate policies that support family-friendly work environments for teachers, such as flexible working hours where possible, to reduce role conflict and promote social harmony.

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Locust Control Self-Esteem as Correlates of Marital Success Among Married Female Teachers in Senior Secondary Schools in Sokoto Metropolis; Implications for Counselling

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Abstract

This study investigated locus of control and self-esteem as correlates of marital success among married female teachers in senior secondary schools in Sokoto metropolis, Nigeria, with implications for counselling. The research examined the relationships between internal locus of control, external locus of control. Descriptive research design of correlational type was adopted for this study. The population of this study was comprised of all female teachers who are teaching in public senior secondary schools in Sokoto metropolis according to Ministry of Education Sokoto there are five hundred and fifty-five (555) female teachers in public senior secondary schools in Sokoto metropolis. Research Advisor's (2006), table for determining sample size from a given population was used and arrived at 217 female teachers as sample of the study. The instrument developed by the researcher "Locus of Control, Self-esteem and marital success questionnaire was given to expert in test and measurement in the Department of Educational Foundations in Sokoto State University, Sokoto. The score obtained from the test and retest were compared using Pearson's Product Moment Correlation Coefficient and a correlation index of 0.878 was obtained. However, the reliability index of 0.878 for a research instrument is considered reliable for the study as suggested by Kahler (2017). The findings revealed a significant positive relationship between internal locus of control and marital success, as well as between high self-esteem and marital success. Conversely, significant negative relationships were found between internal locus of control and external locus of control. The regression analysis further showed that internal locus of control and external locus of control were negative predictors. Based on these findings, the study concludes that locus of control and self-esteem play vital roles in determining marital harmony among married female teachers. It was recommended that teachers should develop internal control orientations and healthy self-esteem, while counsellors should design intervention programmes aimed at strengthening these psychological resources.

Keywords: Locus of Control, Internal Locus of Control, External Locus of Control, Sokoto metropolis, and Counselling

Introduction

Marriage is a vital institution that significantly influences individuals' well-being, and understanding its dynamics is crucial for fostering healthy relationships. Among the myriad of factors shaping marital success, psychological dispositions such as locus of control have gained attention for their impact on interpersonal dynamics. Locus of control, a concept rooted in social psychology, refers to individuals' beliefs about the extent to which they can control events in their lives. Investigating the correlates of marital success in this demographic is essential for understanding the complexities of marital relationships within this context. Recent research has highlighted the relevance of locus of control in predicting various aspects of marital success.

Locus of control and self-esteem are closely interconnectedness traits that significantly correlate with marital success among married female teachers in senior secondary schools. Locus of control whether an individual perceives events as within their control (internal) or influenced by external forces (external) impacts relationship dynamics and conflict resolution Johnson, (2020). Research indicates that women with an internal locus of control generally experience more marital satisfaction due to their proactive approaches in addressing marital challenges (Smith & Jackson, 2022). Self-esteem, reflecting one's self-worth and confidence, is another vital correlate.

Self-esteem, a cornerstone of psychological well-being, lies at the heart of how individuals perceive and evaluate themselves in the world. Defined as the overall subjective evaluation of one's own worth and value, self-esteem encompasses feelings of self-acceptance, self-respect, and self-confidence (Orth, Robins, & Widaman, 2019).

Locus of control, a concept introduced by Julian B. Rotter in the 1950s, refers to individuals' beliefs about the extent to which they can control events that affect them. It can be broadly categorized into two types: internal locus of control and external locus of control.

Internal locus of control refers to the belief that an individual's actions and decisions have a significant impact on the outcomes they experience in life. Individuals with an internal locus of control attribute their successes and failures to their own abilities, efforts, and choices, rather than external factors such as luck or fate. They feel a sense of control over their circumstances and

believe they can influence events through their actions and decision-making processes. Internal locus of control refers to the belief that an individual's own actions and decisions primarily determine the outcomes they experience in life. "Internal locus of control reflects the belief that individuals' actions and decisions largely determine their outcomes in life, leading to a sense of personal responsibility and empowerment" (Smith & Johnson, 2023).

External locus of control refers to the belief that external factors, such as luck or fate, primarily determine the outcomes individuals experience in life. External locus of control reflects the belief that individuals' outcomes are primarily determined by external factors beyond their control, leading to a sense of powerlessness and dependency" (Smith & Johnson, 2023).

Locus of control, a concept introduced by Julian B. Rotter in the 1950s, refers to individuals' beliefs about the extent to which they can control events that affect them. Internal locus of control refers to the belief that an individual's actions and decisions have a significant impact on the outcomes they experience in life. "Internal locus of control reflects the belief that individuals' actions and decisions largely determine their outcomes in life, leading to a sense of personal responsibility and empowerment" (Smith & Johnson, 2023).

"External locus of control reflects the belief that individuals have little control over their outcomes and experiences, leading to feelings of helplessness and resignation" (Garcia & Martinez, 2023). Self-esteem, a cornerstone of psychological well-being, lies at the heart of how individuals perceive and evaluate themselves in the world. Defined as the overall subjective evaluation of one's own worth and value, self-esteem encompasses feelings of self-acceptance, self-respect, and self-confidence (Orth, Robins, & Widaman, 2019). Marriage is a social institution that has been a cornerstone of human society for millennia, serving as a foundation for family structures, kinship ties, and the transmission of cultural values across generations. For example, Johnson and Wu (2021) conducted a longitudinal study examining the factors associated with marital stability and satisfaction over time.

Smith and Brown (2022) investigated the relationship between self-esteem and marital adjustment among married women in the United Kingdom. The study aimed to explore how varying levels of self-esteem impact emotional intimacy, communication, and conflict resolution within marriages. Zhang and Wang (2023) conducted a study on the relationship between locus of control

and marital satisfaction among female teachers in China. The study aimed to explore how locus of control influences marital satisfaction within the context of the teaching profession in urban and rural China. Van der Meer and De Vries (2022) investigated the relationship between self-esteem and marital adjustment among married women in Amsterdam, the Netherlands.

Statement of the Problem

Marriage in Sokoto metropolis and state at large is considered as intimate relationship that act as ways of devotion to Allah and seek Allah pleasure to it. It is also regarded as a way of satisfying psychological, physiological, social and security needs of human being (Tambawal, 2021). The happening of intolerance brutality inadequate or lack of determination of unfaithfulness among married people, husband or wife attacking one another, beating or assaulting make some people to become afraid and don't if any or satisfaction of above mention factors can be realize through it (marriage).

Marriage failure is now the trend in the metropolis and state at large and it has its own consequences affecting social, psychological, physiological and emotional life of the husband and wife as well as their children the marriage failure is more endemic in Africa and Asia than in Australia and Europe. High rate of divorce in Africa was traced to westernization, urbanization, industrialization and globalization. The extended family that used to resolve dispute between husband and wife is no longer active like in the past because of the shift toward nuclear family system distinguished by less involvement in the resolution of marital conflicts.

The case of Hadiza Garba in Sokoto North Local Government sued her husband to Kanwuri lower shariah court of sokoto north local government with case number CV/31/2023 demand for marriage dissolution due to denial of food and beating just causes she refuse to succumb to his interest of marrying another wife these plus many cases of marriage dissolution in Sokoto State are cases of grief worry and distress to stakeholders. The main thrust of the present study, therefore, was to examine locus of control and self-esteem as correlates of marital success among married female teacher in senior, secondary school in Sokoto metropolis; with a view to provide its implications for counseling.

Objectives of the Study

The objectives of this study are:

1. To determine the relationship between the internal locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis
2. To evaluate the relationship between the external locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis

Research Hypotheses

The following hypotheses are formulated to be tested in this study

H₀₁: There is no significance relationship between internal locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis

H₀₂: There is no significant relationship between external locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis

Methodology

Descriptive research design of correlational type was adopted for this study. The population of this study was comprised of all female teachers who are teaching in public senior secondary schools in Sokoto metropolis according to Ministry of Education Sokoto there are five hundred and fifty-five (555) female teachers in public senior secondary schools in Sokoto metropolis. Research Advisor's (2006), table for determining sample size from a given population was used and arrived at 217 female teachers as sample of the study. The instruments used for gathering data for the study would be a researcher's self-developed questionnaire. The instrument developed by the researcher "Locus of Control, Self-esteem and marital success questionnaire was given to expert in test and measurement in the Department of Educational Foundations in Sokoto State University, Sokoto. The score obtained from the test and retest were compared using Pearson's Product Moment Correlation Coefficient and a correlation index of 0.878 was obtained. However, the reliability index of 0.878 for a research instrument is considered reliable for the study as suggested by Kahler (2017)

The statistical bio data of the respondent was analysed with the used of tabulation, frequency and percentages. The null hypothesis one to two was analysed using Pearson Product, Moment Correlation (PPMC). The rationale behind subjected hypotheses one to two to Pearson, Product. Moment Correlation. They are measuring relationship between two variables.

Results

Hypotheses Testing

This section presented statistical analysis of all the null hypotheses formulated for this study and the null hypotheses were tested one after the other at 0.05 level of significance presented as follows:

Null Hypothesis One: There is no significant relationship between internal locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis

In testing null hypothesis one, the responses on internal locus of control and marital success collected from the selected 217 married female teachers in senior secondary schools in Sokoto metropolis, Sokoto state, Nigeria were sorted and correlated electronically on SPSS version 23.0 using Pearson Product Moment Correlation (PPMC) and the results are presented in Table 1.

Table 1: Pearson's Correlation Coefficient for Relationship between Internal Locus of Control and Marital Success of Married Female Teachers in Senior Secondary Schools in Sokoto metropolis

Variable	N	Mean	Std. Dev	Df	r-Cal	p-Value	Decision
Internal Locus	217	13.1982	2.3417	215	0.920**	0.001	H ₀₁
Marital Success	217	13.1951	2.2265				Rejected

Source: Fieldwork (2025)

Table 1 presents a summary of Pearson correlation performed to establish the degree of relationship between internal locus of control and marital Success of Married Female Teachers in senior secondary schools in Sokoto metropolis. The results of the analysis $r(215) = 0.920$, $p < 0.05$ revealed that there was significant very strong positive relationship between internal locus of control and marital Success of Married Female Teachers in senior secondary schools in Sokoto metropolis. However, since the p -Value of 0.001 is less than 0.05 level of significance, the null hypothesis one (H₀₁) was therefore rejected. This implies that higher levels of internal locus of control are associated with

higher levels of marital success. In this study, the participating female teachers in senior secondary schools in Sokoto metropolis found with higher levels of internal locus of control reported very higher levels of marital success.

Null Hypothesis Two: There is no significant relationship between external locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis

In testing null hypothesis two, the responses on external locus of control and marital success collected from the selected 217 married female teachers in senior secondary schools in Sokoto metropolis, Sokoto state, Nigeria were sorted and correlated electronically on SPSS version 23.0 using Pearson Product Moment Correlation (PPMC) and the results are presented in Table 2

Table 2: Pearson’s Correlation Coefficient for Relationship between External Locus of Control and Marital Success of Married Female Teachers in Senior Secondary Schools in Sokoto metropolis.

Variable	N	Mean	Std. Dev	df	r-Cal	p-Value	Decision
External Locus	217	13.5392	2.6316	215	-0.762**	0.001	H ₀₂
Marital Success	217	13.1951	2.2265				Rejected

Source: Fieldwork (2025)

Table 2 presents a summary of Pearson correlation performed to establish the degree of relationship between external locus of control and marital Success of Married Female Teachers in senior secondary schools in Sokoto metropolis. The results of the analysis $r(215) = -0.762, p < 0.05$ revealed that there was high significant negative relationship between external locus of control and marital Success of Married Female Teachers in senior secondary schools in Sokoto metropolis. However, since the p-Value of 0.001 is less than 0.05 level of significance, the null hypothesis two (H₀₂) was also rejected. This implies that higher levels of external locus of control are associated with lower levels of marital success and higher levels of marital failure. In this study, the participating female teachers in senior secondary schools in Sokoto metropolis found with higher levels of external locus of control reported very low level of marital success implying higher risks of marital failure.

Summary of Findings

This study investigated locus of control and self-esteem as correlates of marital success among married female teachers in senior secondary schools in

Sokoto metropolis. However, two corresponding null hypotheses were tested at 0.05 level of significance and the study found that:

1. There was very strong significant positive relationship between internal locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis.
2. There was very high significant negative relationship between external locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis.

Discussion

This study investigated locus of control and self-esteem as correlates of marital success among married female teachers in secondary schools in Sokoto metropolis: Implications for counselling. The study made two (2) major findings in relation to the answered null hypotheses which are discussed in this section as follows:

The findings of this study in relation to corresponding null hypothesis one revealed that there was significant very strong positive relationship between internal locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis. This finding confirmed the previous results of a study conducted by Ibrahim and Mohammed (2021) on the relationship between locus of control and marital stability among married women in Sokoto State, Nigeria and found that women with an internal locus of control demonstrated higher marital stability, characterized by better conflict resolution and stronger emotional bonds. Conversely, women with an external locus of control reported lower marital stability due to increased dependence on external factors and less proactive problem-solving. The study recommended counseling interventions to develop internal locus of control among married women and promote marital stability. Similarly, community programs addressing cultural practices that reinforce external locus of control were also suggested. Future research should explore other psychological and socio-cultural factors influencing marital stability in similar contexts.

In addition, the results also corroborated the findings of Johnson and Williams (2021) who explored the relationship between locus of control and marital adjustment among married women in the United States. The study employed Pearson's correlation and multiple regression analyses for hypothesis testing and findings showed that women with a high internal locus of control

exhibited better marital adjustment, characterized by effective conflict resolution, open communication, and emotional stability. Conversely, an external locus of control was associated with poorer marital outcomes, including heightened conflict and dissatisfaction. The researchers recommended programs to enhance women's self-efficacy and emotional resilience as a way to improve marital adjustment. They also advocated for integrating counseling services into community centers to support married women. Further studies were suggested to explore the role of cultural norms in shaping locus of control and marital dynamics.

Furthermore, the findings of the study was in line with the results of a similar study by Zhang and Wang (2023) who conducted a study on the relationship between locus of control and marital satisfaction among female teachers in China. The study explored how locus of control influences marital satisfaction within the context of the teaching profession in urban and rural China and found a significant positive Pearson's correlation coefficient between an internal locus of control and marital satisfaction, which implies that teachers with an internal locus of control reported higher levels of marital satisfaction due to proactive conflict resolution and emotional stability. Conversely, a significant negative correlation was observed between an external locus of control and marital satisfaction. Therefore, this results open up a window for integrating stress management and emotional resilience training into teacher development programs to enhance more marital adjustments and success among married female teachers in Sokoto metropolis. it is also important to identify and promote for policies that provide professional counseling services to enhance marital satisfaction.

The finding of corresponding null hypothesis two (H_{02}) revealed that very high significant negative relationship exists between external locus of control and marital success among married female teachers in senior secondary schools in Sokoto metropolis. This finding corroborated the findings of Abdullahi and Ibrahim (2021) whose study investigated the relationship between locus of control and marital satisfaction among female teachers in Kano State, Nigeria. The study explored how perceptions of control over life events influence marital outcomes within the teaching profession. The study employed Pearson correlation and regression analysis and found a significant negative correlation between external locus of control and marital satisfaction while conversely a significant positive correlation between internal locus of control and marital satisfaction was established, suggesting that women who

perceived greater control over their lives reported higher marital satisfaction while other who perceived less control over their lives reported higher marital dissatisfaction. Thus, the study emphasized the importance of discouraging an external locus of control and fostering an internal locus of control to enhance marital satisfaction. In these regards, counselors and educator should provide programs to develop internal locus of control among married female teachers. In addition, workplace policies should include support systems for managing stressors that could affect marital satisfaction.

Conclusion

Based on the findings, the study concludes that marital success among married female teachers in Sokoto metropolis is strongly influenced by locus of control and self-esteem. Teachers with an internal locus of control is more likely to report marital satisfaction, stability, and resilience. Conversely, those with an external locus of control face increased risks of marital dissatisfaction and instability.

Recommendations

Drawing from the findings, the following recommendations are made:

1. Married female teachers should be encouraged to develop internal locus of control by taking responsibility for marital challenges and actively engaging in constructive conflict resolution.
2. School and marital counsellors should integrate external locus of control building programs into counselling sessions for married female teachers.

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Relationship between Establishment of Commercial Venture and Managerial Effectiveness in Federal Universities in North West, Nigeria

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Abstract

The study was conducted to evaluate the relationship between the establishment of commercial venture and managerial effectiveness in federal universities in northwest Nigeria. It was guided by three (3) objectives questions, three (3) research questions and one (1) null hypotheses. A correlational research design was used for the study. The population of the study was 14811 which consisted of both lecturers 7118 and management staff 7693 of federal universities in the northwest, Nigeria. The sample of the study consisted of 702 respondents which were selected out of the population of the study using research advisors [2006] table. Structured questionnaires titled Establishment of Commercial Venture Questionnaires (ECVQ) and Managerial Effectiveness Questionnaire (MEQ) were constructed by the researcher. The researcher designed the questionnaire based on five rating scale such as VHE, HE, ME, LE VLE. After validation, pilot test was conducted. 30 Copies of the questionnaires were administered to the respondents from Sokoto State University and Shehu Shagari University of Education who are not part of the sample respondents. The responses were collected and correlated using Cronbach Alpha statistical formula, using SPSS Version 30. The internal consistency of the instruments was determined using Cronbach alpha reliability. The reliability coefficient for managerial effectiveness was 0.848. The researcher with the aid of five (5) research assistants administered the instrument to the respondents. Mean, percentage and frequency counts were used to answer the research questions while corresponding hypotheses were tested using Pearson Product Moment Correlation Coefficient (PPMC) using Statistical Package for Social Science (SPSS version 30). The study concluded that with little grant from the government, Universities can stand firm with the establishment of commercial venture. Hence every institution should invest in business as it is one of the sources of development. Vice Chancellor of Universities should be more vigilant and ensure effective monitoring and supervision of establishment of commercial venture so as to utilize the fund effectively. Funds which are generated internally by the universities need to be managed judiciously to achieve a holistic development of the universities.

Keywords: Commercial, Venture, Managerial, Effectiveness and Universities

Introduction

Nigeria education is graded from primary, secondary to the tertiary education. Among tertiary educations, universities are the real focus of this seminar. A university represents the highest point of academic pursuit where degrees are awarded or some sort of other certificate. It provides the environment where a community of scholars engage in teaching and learning research, as well as community services Sambo (2011) said that, postgraduate students at masters and doctorate levels are required to produce original works that add to knowledge. University education leads to further learning and discoveries. It exposes students to new research and technology. It encourages creative and independent thoughts. This is why candidates for admission are expected to indicate capability for independent studies.

Education is capital intensive and demands a lot of funds to grow in order to achieve the importance of education in national development, but the challenge of funds cannot be exaggerated. Education needs to be funded. The challenge remains how to finance this massive education internally. Prior to Nigeria independence, individual found ways of funding their education, but after independence, government try to take over such responsibilities. As the population to be educated increase, it becomes imperative that something needed to be done in order to fund education.

Education is the process of teaching, training and learning especially in schools, colleges or universities to improve knowledge and develop skills. Serious attention should be paid to tertiary education as the bulk of civil service manpower is obtained from that level. Okojie (2015) said that one of the major role of National University Commission (NUC) is to ensure that all Nigeria universities meet minimum academic standard. The only snag is sourcing for funds to do so, hence the need for this seminar. Otomowo (2018) said that higher education has been speculated to be disfunctional as a result several problems both within and outside the school system. Establishment of commercial venture is a concept of dwindling financial flow from the government to tertiary institutions. It has become very important at the tertiary level of Nigeria University system. Establishment of commercial venture and managerial effectiveness can no longer be ignored. It has come to the front burner at both the political and educational spheres.

Managerial effectiveness is that management activity which is concerned with the planning and controlling of an institutional resources. In educational management activity that is concerned with decision on how to procure, expend, disburse and give account of fund provided for the implementation of educational programs. Ley (2023) said that, managerial effectiveness refers to manager's ability to achieve the organization goals and balance employees' expectations and development. Omisore and Okofu (2014) said that, recruitment and selection of staff in any organization be it public or private sector is of paramount importance to the organization. This is so because it is the staff that turns the vision and mission of the organization into reality. In order to show managerial effectiveness, the administrator of educational institution should see that the staffs adhere to rules and regulations guiding the institution. In any institution where establishment of commercial venture exists, managerial effectiveness is very important. It helps any project going on to function well without any ambiguity.

Commercial ventures are activities carried out in order to generate profit. Commercial venture is an attempt by individual to improve their economic standards by using their money or skills to make money. Some of these commercial ventures include the following: sachet water manufacturing, business center equipped with computers, Internet services, photocopies, printing machine and so on, inside and outside the school to generate revenue for funding their programmes. Obanya, in Manga, (2015) identified types of goods that school could produce and sell as part of school commercial venture. They include: arts and crafts, farm products, poultry products, farm animals, water supply (Tank), stationaries, clothing materials, soft drinks, provision, car stickers and fishes. Funds can also be generated internally through the use of commercial services; publishing and printing press, barbing saloon center, establishing or private radio station, school recreation center, tailoring center within and outside the school.

Akinyeni (2013) expressed that, commercial services are profit oriented activities which represent a major way of raising revenue for tertiary institutions. Aloa, (2010) said that, tailoring service provision in tertiary institutions are very compelling, considering the enormous market and population available such as students, staff, the community and general public will patronize the services through sewing their clothes for both male and female especially where students are using school uniform for training interested personnel. With these, the institution will generate reasonable

revenue to run their programme. Okpon (2015) explained that, business centre/internet cafe, in view of the fact that the higher institutions of learning are gradually going digital, the establishment of a business centre/internet cafe is therefore a matter of necessity. Internet cafe is necessary because information and communication technology (ICT) is now the order of the day. Singtel (2022) reviewed that, the purpose is to empower every generation harnessing technology to empower people and businesses and create a more sustainable future. Bamiro (2011) on the other hand said that, commercial venture are profit oriented activities which represent a major way of raising additional revenue for higher educational institutions system. Bamiro (2011) however viewed that the school can run commercial services to include supermarket, bakery, fuel station, table water manufacturing, business centre equipped with computers, internet services, photocopiers, printing machines, binding and lamination machine inside and outside the school environment use to generate revenue internally for funding their programme.

Managerial effectiveness can be seen as a measure of school achievement (Kwashabawa, 2017). Managerial effectiveness in schools or institution requires the achievement of the objectives of establishing the school or the institution. It is all about doing the right things, optimizing resources utilization, producing creative alternatives, and increasing output. Effectiveness can also mean maximization of individual potentials, values contributed to the society and the satisfaction of employees need. According to Bolatito (2020), effectiveness needs to be distinguished from efficiency. Efficiency implies a comparison between cost and results, while effectiveness means achieving a goal. An ineffective manager is a way of crashing or disrupting the progress of an organization. Ineffective management is manifested through hesitant decision – making, poor communication skills, poor human relation, and inadequate initiatives poor motivation leading to low morale among workers, uninspiring personality and low productivity. Otley (2019) explained that, managerial effectiveness is the extent to which managers achieve the organizational goals through their traditional functions which include planning, coordinating, controlling, organizing, etc.

Statement of the Problem

There is an unresolved argument as to whether the funding of education is the sole responsibility of the government or parents. The government of Nigeria used to wholly fund education at all levels. But as schools grow in numbers

and students population exploded, the government is no longer able to solely fund education.

The federal government of Nigeria worried about the incessant complaints of poor funding of public institutions of learning advised university managers through the National University Commission (NUC) to explore various ways of generating ten percent (10%) of their expected revenue from within and outside their institutions towards solving their finance related problems rather than depend almost entirely on grants from the Federal Government. One of that major roles of the NUC is to ensure that all Nigerian universities meet minimum academic standard.

There are various programme and initiatives by the government to enhance establishment of commercial venture for example, the Structural Adjustment Programme (SAP) subsequent to the Nigeria economy crisis has further shrunk government funding of tertiary education. Other contributing factors to underfunding of tertiary education include: inadequate planning, proliferation of universities and other institution of higher learning and expansion of enrolment, academic verses non-academic employment ratio among others. The inadequate funding of higher education has no doubt affected teaching and learning. This was why institutions of higher learning have been forced to embark on income generating in order to source for alternative income for the institutions.

Objectives of the Study

This study sought to;

1. Determine the level of establishment of commercial venture in federal universities in North-West Nigeria.
2. Examine the level of managerial effectiveness in federal universities in North-west Nigeria.
3. Determine the relationship between establishment of commercial venture and managerial effectiveness in federal universities in North-West Nigeria.

Research Questions

This study provided answers to the following research questions:

1. What is the level of establishment of commercial venture in federal universities in North-West Nigeria?
2. What is the level of managerial effectiveness in federal universities in North-West Nigeria?
3. What is the relationship between establishment of commercial venture and managerial effectiveness in federal universities in North-West Nigeria?

Research Hypothesis

The following null hypotheses were formulated at 0.05 level of significant:

H₀: There is no significant relationship between establishment of commercial venture and managerial effectiveness in federal universities in North-West Nigeria.

Methodology

Methodology specifically deals with the research design, population of the study, sample and sampling techniques, instrumentation, validity and reliability of the instrument, method of data collection and method of data analysis.

The researcher used correlational research design which explains simple relationship between two or more variables as explained by Creswell (2012). It is a correlational research design in which a researcher is interested in the extent to which two variables or more co-vary, that is, where changes in one variable are reflected in changes in the other. Correlational designs consist of simple association between two variables. (e.g playing with electronic toys and becoming an electronic engineer). The research design is suitable for the study because the study aimed to ascertain the relationship between establishment of commercial venture and managerial effectiveness in federal Universities in North-West Nigeria. The population of the study comprised management staff and lecturers of the federal universities in Northwest Geo-Political Zone Nigeria. The Respondents are academic and non-academic staff. The study population consist of seven thousand six hundred and ninety-three (7693) management staff and seven thousand, one hundred and eighteen (7,118) lectures given a total of fourteen thousand eight hundred and eleven (14,811) as Respondents of the study. This section presents sample of the study and sampling techniques used in this study. The researcher selected four

(4) states out of seven (7) states in North-West geo-political zone, Nigeria and choose one federal university from each state. They include; Bayero University Kano, Federal University Birnin-Kebbi, Federal University Gusau, and Usmanu Danfodiyo University Sokoto. Random sampling technique was used to select four (4) universities out of seven (7), while Proportionate Sampling was used to determine the sample size of the Respondents.

The study used self-designed questionnaires titled: Establishment of Commercial Venture Questionnaire (ECVQ) and Managerial Effectiveness Questionnaire (MEQ) to elicit data from the targeted respondents. The establishment of commercial venture questionnaire (ECVQ) has two sections namely A and B. Section A consisted of personal data of the Respondents which has five (5) items (name of institution, Sex, Age, Educational qualification, Working experience). While section B has twenty-five (25) items constructed based on research questions. Managerial effectiveness questionnaire (MEQ) also has twenty-five items constructed based on research question. The study used five (5) rating scale such as Very High Extent, High Extent, Moderate Extent, low Extent and Very Low Extent. The researcher measured the responses of the Respondents. In order to validate the instruments and to make them valid for this study, the copies of Establishment of Commercial Venture questionnaire (ECVQ), Managerial Effectiveness Questionnaire (MEQ) were given to the researcher's supervisors who are experts in the field of Education Management in the Department of Educational Foundations, as well as, other experts in Research Method in the Faculty of Education, Sokoto State University, Sokoto. The establishment of commercial venture has thirty-two (32) items, but after expert validation, the items were reduced to twenty-five (25) based on expert's recommendations and suggestions. Therefore, the content validity index for establishment of commercial venture is calculated as follows $25/32 = 0.7$. So, the 0.7 is considered as a significant which indicated that the instrument is valid at significant level. Also, the managerial effectiveness was twenty-seven (27) items and after the expert's validation, the items were reduced to twenty-five (25) and is calculated as follow $25/27$ which gives 0.9 which is considered as very good and indicated that the instrument is valid at significant level.

The statistical table of Cronbach's Alpha reliability with twenty-five (25) items for establishment of commercial venture was calculated using SPSS version 30. The calculated value of Cronbach's Alpha reliability was 0.864 (see Appendix II SPSS). Managerial Effectiveness questionnaire (MEQ) was

calculated using SPSS version 30. The calculated value of Cronbach's Alpha reliability was 0.848 (see Appendix II SPSS). This was found to be reliable because Cronbach alpha value of 0.7 or higher is usually considered to be accepted and the value of .950 to 1 is usually considered very high. Therefore, establishment of commercial venture (ECVQ) was reliable and accepted for data collection. In order to ensure successful and accurate data collection through administration of the research instruments, the researcher employed five (5) research assistants in order to distribute the questionnaires to the respondents in federal universities in north-west Nigeria. The researcher and research assistants introduced themselves to the management staff and lecturers in the federal universities in north-west Nigeria to seek permission before the questionnaires were administered to the respondents. The respondents (management staff and lecturers) were asked to fill the questionnaires.

In order to analyze data to be collected through questionnaires, descriptive statistics such as mean (\bar{x}), percentage (%) and frequency counts were used to answer research questions, while corresponding hypotheses were tested using Pearson Product Moment Correlational Coefficient (PPMC) using Statistical Package for Social Science (SPSS) version 30.

Results

The researcher presented and analyzed the results of data from the field.

Research Question One: What is the level of establishment of commercial venture in Federal Universities in North-West Nigeria?

This research question was answered and presented in Table 1 below.

Table 1: Level of Establishment of Commercial Venture in Federal Universities in North-West Nigeria

SN	Item statement	HE		ME		LE		X	SD	Level
		F	%	F	%	F	%			
1	Establishment of commercial venture generate money for the institution.	690	98.3	9	1.3	3	0.4	4.7	0.53	HE
2	Building of nursery and primary school generates funds for the institution.	668	95.2	19	2.7	15	2.1	4.6	0.57	HE
3	Provision of sachet water manufacturing company generates revenue to the institution.	668	95.2	19	2.7	15	2.1	4.7	0.69	HE

4	Opening bookshops and printing press generates money to the institution.	685	97.5	14	2.0	3	0.4	4.7	0.53	HE
5	The use of university buses to convey students and visitors to and from the institution will generate funds for the universities.	684	97.4	16	2.3	2	0.3	4.7	0.55	HE
Grand Mean (X̄)		4.7		4.7		0.57		HE		

Sources: Fieldwork, 2024

The responses from Table 1 indicate strong affirmation that there is higher extent on the level of establishment of commercial venture and managerial effectiveness in Federal universities in North-Western, Nigeria. Item one of the Table 1 indicates a mean of 4.7 and standard deviation of 0.53 with 98.3% responses indicating higher extent and 0.4% indicating lower extent. This means that establishment of commercial venture generate money for the institution. In the same table item two indicates mean of 4.6 and standard deviation of 0.57 with 95.2 % of the responses indicating higher extent that building of nursery and primary school generates funds for the institution. Item three indicates a mean of 4.7 and standard deviation of 0.69 with 95.2% with view that provision of sachet water manufacturing company generates revenue to the institution. Item four indicates mean of 4.7 and standard deviation of 0.53 with 97.5% responding higher extent with the opinion that opening bookshops and printing press generates money to the institution. Item five indicates a mean of 4.7 and standard deviation of 0.55 with 97.4% responding higher extent with the statement that the use of university buses to convey students and visitors to and from the institution will generate fund for the university.

Research Question Two: What is the level of managerial effectiveness in Federal Universities in North-Western Nigeria?

This research question was answered and presented in Table 2.

Table 2: Level of Managerial Effectiveness in Nigeria Universities

SN	Item statement	HE		ME		LE		X	SD	Level
		F	%	F	%	F	%			
1	My school ensures employees are working towards accomplishment of the goals of the organization.	68	98	14	2.0	0	0	4.7	0.52	HE
2	My school ensures stringent	69	98.	11	1.6	0	0	4.7	0.50	HE

	obedience of guiding principles, rules and regulations in the organization.	1	4								
3	My school ensures equal distribution of work responsibility according to the employee's specialization.	69	98.4	5	0.7	3	0.4	4.7	0.51	HE	
4	My school ensures competent staffs are employed on merit.	69	99.6	3	0.4	0	0	4.7	0.47	HE	
5	My school ensures strict compliance with the reward and punishment policy.	68	97.2	10	1.4	1	1.4	4.6	0.66	HE	
		0.	7					4.7	0.53		
	Grand Mean (\bar{x})										

Source: Field work (2024)

The table 2 above reveal that the respondent indicated affirmation that there is higher extent of managerial effectiveness, the information on the table indicates at higher extent level of managerial effectiveness in Federal Universities in North-West, Nigeria. Item one indicates a mean of 4.7 and standard deviation of 0.52 with 98% of responses indicating that my school ensures employees are working toward accomplishment of the goals of the organization. Item two indicates a mean of 4.7 and standard deviation of 0.50 with 98.4% of the responses indicating that my school stringent obedient of guiding principles, rules and regulation in the organization. Item three indicates a mean of 4.7 and standard deviation of 0.51 with 98.9% of the responses indicating that that my school ensures equally distribution of work responsibility according to employees' specialization. Item four indicate a mean of 4.7 and standard deviation of 0.47 with 99.6% of the responses indicating that my school ensures competent staffs are employed on merit. Item five indicate a mean of 4.6 and standard deviation of 0.66 with 97.2% of the responses indicating that my school ensure strict compliance with reward and punishment policy.

Hypothesis Testing

H₀: There is no significant relationship between establishment of commercial venture and Managerial Effectiveness in Federal Universities in North –West, Nigeria.

Table 3: Relationship between commercial Ventures and Managerial Effectiveness

Variables	N	Mean	SD	r-Cal	p-Value	Decision
commercial ventures	702	4.66	0.353			
Managerial effectiveness	702	4.66	0.184	0.470	0.000	Rejected

The result indicated $N = 702$, Mean = 4.66 and SD = 0.353 on commercial ventures and $N = 702$, Mean = 4.66 and SD = 0.184 on managerial effectiveness. The analysis also revealed a calculated r -Cal of 0.470 and p -value of 0.000 at 0.05 level of significance. Therefore, since p -value of 0.000 is statistically less than the level of significance of 0.05, the null Hypotheses which stated that there is no significant relationship between commercial venture and Managerial Effectiveness in Federal Universities in North –West Nigeria was rejected. This means that there is significant relationship between commercial venture and managerial effectiveness in Federal Universities in North –West Nigeria.

Summary of Findings

The following are the major findings of the study:

1. There is high level of establishment of commercial venture in Federal Universities in North-West, Nigeria.
2. There is high level of Managerial Effectiveness in Federal University in North-West, Nigeria.
3. There is significant relationship between establishment of commercial ventures and managerial effectiveness of Federal Universities in North-West, Nigeria. This means that establishment of commercial ventures is an indicator of managerial effectiveness in Universities in North-West, Nigeria.

Discussion

This section discusses the finding of the study. The study investigates establishment of commercial venture and managerial effectiveness in federal universities in northwest, Nigeria. Results were discussed according to research hypotheses in the study. The finding of the hypotheses which stated that there is no significant relationship between commercial venture and management effectiveness was rejected as the finding show that there is significant relationship between commercial venture and managerial effectiveness in Federal University in North-West, Nigeria. This means that establishment of commercial venture is an indicator of managerial effectiveness in North-West Universities, Nigeria. The findings from the result of quantitative analyses also confirm that there is higher extent between establishment of commercial venture and managerial effectiveness. The statement was in line with Okpon (2015) which investigate business

centre/internet café in view of the fact that higher institution of learning are gradually going digitals, the establishment of a business centre/internet café is therefore a matter of necessity. Internet café is necessary because information and communication technology (ICT) is now the order of the day. Everything done in school is through the internet eg: School admission process, examination, preparing results and so on. In this modern education, internet café shows the level of the standard of the institution. This finding is in agreement with Akinyemi (2013), which said that commercial venture are profit oriented activities which represent a major way of raising revenue for tertiary institution. Some institution build bookshop, multi-purpose hall for social activities and other petty trading shops for selling of water and other drinks.

Conclusion

The study has come to realize that with little grant from the government, universities can stand firm with the establishment of commercial venture which includes introduction of transportation services supermarket, sachet water factory, photo coping services, internet café services. All these help to boost institution account.

Recommendations

Based on the findings, this study recommended the following:

1. Special committee should be appointed to the yielding enterprises under the auspices of vice chancellor and members of the governing council.
2. Operation of taxi, Keke-Napep, motorcycle, from gate to inside the school will be an advantage to students and staffs who are not mobile, even those car owners that has tinted glasses. It will help them to reach their lecture venues on time. It will also fetch a lot of funds for the institution.
3. The funds which are generated internally by the universities need to be managed judiciously to achieve a holistic development of the universities.

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Assessing the influence of Motivation on Job Performance Among Lecturers in State Owned Universities in Sokoto State

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Abstract

The study investigated the influence of motivation on job performance among state owned Universities in Sokoto State. Two objectives, two research questions are stated respectively for the study. Descriptive survey research design was adopted for the study. The population of the study consisted of four hundred and fifty five (455) lecturers among state owned Universities in Sokoto State which comprised of Sokoto State university with two hundred and ninety seven (297) lecturers and Shehu Shagari University of Education Sokoto with one hundred and fifty eight (158) lecturers and sample of two hundred and nine (209) was obtained using Raosoft application software. A researcher questionnaire titled motivation and lecturers job performance. The instrument was subjected to corrections and secreting by the experts in the Department of Educational Management, Faculty of Education, Sokoto State University. While the reliability index was estimated using Cronbach's Alpha statistics and it produced an average index 0.88. Mean and standard deviation for the secretive data were used. The study concluded that There is a significant influence of Salary on job performance among lecturers in Sokoto State Universities and also there is a significant influence on transportation among lecturers in Sokoto State Universities. The study recommended that Salary of the lecturers should be improved by implementation of the appropriate scale and increment as approved by the federal government. The will make them have an improved job performance. State government should make available buses for conveying both lecturers and students from and to the institution and should ensure that the condition of the buses is perfectly good.

Keywords: Motivation, Salary, Transportations, job performance

Introduction

The importance of motivation to employee in an organization cannot be over-emphasized. Modern managers believed that motivation is an ingredient which enhances employees job performance. There is no gainsaying the facts that

highly motivated employees perform their duties efficiently and effectively in order to achieve overall organizational goals and objectives.

Mangal (2012) regarded motivation as something which prompts, compels and energizes an individual to act or behave in a particular manner at a particular time for attaining some specific goal or purpose. The real activating forces that push and pull an individual to move or act for achieving specific goals include needs and drives. Needs are general wants or desires. Every human being has to strive for the satisfaction of his basic needs if he has to maintain or improve or fulfill in the world. Derives refers to an aroused awareness, tendency or a state of heightened tension that sets off reactions in an individual and sustains them for increasing his general activity level. The existence of a need moves or derives the individual from within and direct his activities to a goal that may bring about satisfaction of that need.

Motivation can be classified into intrinsic and extrinsic motivation.

Intrinsic motivation refers to the internal factors that drive individuals to engage in an activity for its own sake, without any external rewards. It is driven by personal enjoyment, interest, or satisfaction derived from the activity itself. For example, an individual studying a subject out of sheer curiosity or passion while, extrinsic motivation refers to the external factors that drive individuals to engage in an activity to obtain external rewards or avoid punishment. It involves performing a task to receive tangible rewards or to meet external expectations. Examples include working for a promotion, earning a salary, or avoiding disciplinary actions. Mangal (2012).

Job performance refers to the effectiveness and efficiency with which an individual performs the tasks and responsibilities associated with their job. In the context of university lecturers, job performance can be measured by various indicators such as teaching effectiveness, research productivity, academic contributions, and student outcomes. Several factors can influence the job performance of university lecturers. Mangal (2012).

Staff in tertiary institutions fall in the category of civil servants, as such statutory salary payments are made under the regulation of the government through agencies responsible for employment and salaries. Upon approval of the salary in the respective financial year, the disbursement of salaries is affected by the Ministry of Finance in facilitation by banks to which the staff subscribed during the first appointment. The salary payments of tertiary

institutions' staff do not base on the leadership title one holds at school but rather it is based on entry education qualification and experience due to escalating in Nigerian tertiary institutions' Scales (CONUASS), (COMPACAS) (HATISS) (CONTISS) etc Aminu (2008).

In Nigerian academic and non-academic system, especially in the tertiary institutions, staff earns varied salary and wages depending on whether the staff is a senior or junior. Under normal circumstances, collective bargaining contracts provide for different rates of wages for diverse categories of employees performing the same kind of work. Such differences are clearly defined, except where and when used by the employers to discriminate on the basis of race, colour, religion, sex or nationality. It has been observed that this type of wage differentiation is mostly adopted by public sector organizations especially those that provide essential services such as medical health workers, security operators and thus requires different shift duties and not in the tertiary institutions communities where staff provides the same academic and non-academic services. The only genuine and acceptable salary and wage differentials in staff's pay should be based on substantive positions and grade levels of teaching and non-teaching staff but this is not true to State Owned tertiary institutions in the Northern States in Nigeria.

Salary as a partial motivator for the staff of the tertiary institutions determines the operational performance of the system especially when effectively and appropriately or objectively applied. The overall performance in the tertiary institutions should be related to such variables as increasing quality graduates produced, improved service delivery, available infrastructural development or obtaining the best results in important areas of organizational activities.

From the outset, tertiary institutions are the focal points and drivers of societal development in all countries. At the same time, they are the biggest sources and houses of the World's brains, brawn, money talent, ambition and vision- all of which need to be deployed towards the sustenance of the society. This emphasis has meant an increase in staff and students' enrolment in most tertiary institutions. In other words, the ever-increasing student and staff population in Nigerian tertiary institutions and against the background of achieving sustainable learning and working environment, journey to school and work is no doubt a very crucial aspect of tertiary education (Odugbemi. 1997). This implies that, mobility and accessibility in tertiary institutions is a fundamental necessity.

It should however be noted that, the unavoidable implication of the alarming increase in staff and students' population in tertiary institutions is the inability of the institution owned transportation services to meet the basic mobility needs of the users. Based on this, various modes of public transport compliment the tertiary institutions transport service supply. Public transport is however described as vehicles licensed to provide stage carriage service for hire and perhaps reward (Nash. 1982: Bus and Coach Council. 1984). It is also considered as a means for earning passengers and goods either by private vehicles or and public carriers for hire, to earn money (Adeniji, 1984: 1987; 1993 and Badejo, 1993 and 2000). Badejo. (1993) noted that, any vehicle, including vehicles not registered as stage carriages, such as buses, that have, fixed routes and including taxi cabs with no fixed routes, used for hire and reward, and with varying areas, supported by Federal, State or Local government laws are considered as public transport. The observation of Badejo does not include the informal unlicensed public-transport operators known as "kabu-kabu" and the rapidly growing motor-cycle mode of public transport.

Transportation is an important aspect of settlements. To minimize the distances between and among complementary nodes, this demand is sought. The need for transportation rises as physical space for human activity rises, and the quality of transportation at any given time has an impact on how people interact in space. In the course of their daily activities, people create and attract a variety of trip types daily within and across spatially separate but complementary and highly specialized land uses in towns all over the world (Smith, 2020).

The most common perception of transportation is that it is a necessary component of human activity and, in many respects, the foundation of all socioeconomic transactions (Agunloye, 2008). In other words, a sustainable civilization cannot exist without effective transportation. In fact, without a practical form of transportation, no two places will be able to communicate successfully. It has been determined that land usage affects transportation. In many developing nations, poor transportation infrastructure and services are more often than not. The mobility of staff and students in Nigerian federal and state tertiary institutions has increased. It is a prerequisite for effective learning and work activities. Therefore, according to Olegbeji and Olufemi, (2007), tertiary institutions need to ensure and provide more accessible and efficient transport services that can serve all categories of students or staff.

Also, time management and organizational skills is considered a crucial factors that can influence the job performance among state owned Universities in Sokoto State lecturers effective time management, organizational skills, and the ability to balance teaching, research, administrative duties, and other responsibilities contribute to job performance efficiently managing work load and meeting deadlines is important. Allen (2017).

Furthermore, interpersonal skills is a crucial factor for Sokoto State owned Universities lecturers job performance. Building positive relationship with students, colleagues, and staffs. Lecturers should demonstrate professionalism, respect, and approach ability and effectively collaborate with colleagues and contribute to a supportive academic environment. Also, professional development has an influence on university lecturers. Engaging in continuous professional development activities, such as attending workshops, conferences and seminars helps lecturers stay updated with new teaching techniques, research methodologies and advancement in their field. Allen (2017).

Additionally, provision of institutional support adequate resources, infrastructures and support from university, such resources and administrative assistances, can have a significant impact on job performance among state owned Universities in Sokoto State lecturers.

Kyari, Abubakar and Ayuba (2021), conducted study d examined the effect of Salaries and Promotion Benefits on performance of non-academic staff in tertiary institutions of Borno state. The provision of proper emolument could be viewed as a mechanism for eliciting greater cooperation and commitment to task performance. A number of factors such as delays in payment of salary, delay in promotion benefits and pay cuts particularly of employees whom are expecting pay increase to augment their cost of living can have unexpected effects on performance. Explanations exist that such irregularities could damage employee morale leading to lower performances. The population of the study was 960. With a sample size of 282 respondents arrived at using Yamane's formula. Data were collected using structured questionnaires administered to the respondents. The study used both descriptive and inferential statistics. Regression analysis with the aid of statistical package for social sciences was used to analyze the data collected. Findings of this study revealed that delay in payment of salary, pay cut and delay in payment of promotion benefits has significant effects on employee performance in the study area. Therefore, the study recommended that: Borno state government

should ensure timely payment of salaries in order to induce employee commitment towards task performance. In terms of pay cut, Borno State Government should make consultation with non-academic staff unions in order to avoid industrial disputes. Borno State Government should also make adequate budget to meet up future demands in employee promotional cost and ensure prompt payment of such benefits.

Adamu and Garba (2019), conducted a study and investigated the payment of lecturers' salary and promotion as correlate of lecturers' job performance in Senior Secondary Schools in Adamawa State, Nigeria. This study adopted two research questions and two hypotheses the area of study was Adamawa State, the population was 337 principals and 5128 lecturers. A stratified simple random sampling technique was used to select two education zones out of five and a sample of 332 principals and lecturers was determined using Taro Yarnane's formula. Questionnaire was used to collect data. (PTSPTDQ) and lecturers' job performance questionnaire (T J P Q). The data were analyzed using mean and standard deviation for research questions and the null hypothesis was tested using Pearson Product Moment Correlation Coefficient (PPMCC). Findings indicate that there was significant relationship between payment of lecturers' salary, promotion and lecturers' job performance in senior secondary schools in Adamawa state, Nigeria. The study concluded that payment of lecturers' salaries in senior secondary schools in Adamawa state is moderate and promotion of lecturers in senior secondary schools in Adamawa state is also moderate. And recommended that government should pay lecturers' salaries promptly and promoting them regularly and this will enhance lecturers' job performance.

Agunloye, Taiwo and Orelaja (2021), conducted research and examined the trip characteristics and its effects on trip frequency in the University of Lagos, Nigeria. The study focused on six motor parks in the University of Lagos and its environs (four internal and two external). Based on a preliminary study, the six parks have an average of thirty (30) waiting passengers per hour respectively, most especially during the peak periods. Each Park has an average of eight (8) hours per day, which results into two hundred and forty (240) passengers per/day per/park. Thus, a total of one thousand, four hundred and forty (1440) passengers were available at the six parks during the peak period per week, on the average. This put the sample frame (the passengers) as one thousand, four hundred and forty (1440) passengers. 1-lower, a total

number of three hundred and fifteen (315) questionnaires were completed and analysed. This eventually puts the sample size at 21.9%.

Smith (2020) conducted a study to examine the influence of teaching methods on university lecturers' job performance. The researchers collected data from 200 lecturers across multiple disciplines and analyzed the relationship between their teaching methods and student feedback scores. The findings suggested that lecturers who employed interactive teaching methods such as group discussions and hands-on activities received higher ratings from students compared to those who relied on traditional lecture-style teaching. This study emphasizes the importance of adopting innovative teaching approaches to enhance lecturers' job performance.

The above study and current study differ in terms of scope, population, sample and other additional variables under study.

Research Questions

The following research questions were raised to guide the conduct of the study:

1. What is the influence of salary on job performance of lecturers in State owned Universities in Sokoto state?
2. What is influence of transportation on job performance of lecturers in State owned Universities in Sokoto state?

Objectives of the Study

The study tried to find out the following:

1. Asses the influence of salary on job performance of lecturers in State owned Universities in Sokoto state.
2. Evaluate the influence of transportation on job performance of lecturers in State owned Universities in Sokoto state.

Methodology

Descriptive survey was adopted for this study. The descriptive survey design was used because it is a method of research which concerns itself with the present phenomena in terms of conditions, practices, belief processes, relationships or trends.

The population of the study consisted of four hundred and fifty-five (455) lecturers among state owned Universities in Sokoto State which comprised of Sokoto State university with two hundred and ninety-seven (297) lecturers and Shehu Shagari University of Education Sokoto with one hundred and fifty-eight (158) lecturers and sample of two hundred and nine (209) was obtained using Raosoft application software.

Results

Question 1: What is the influence of salary on job performance among lecturers in Sokoto State owned Universities.

Table 1: Mean and Standard Deviation of Respondents Rating on the influence of Salary on job performance of lecturers in Sokoto State owned Universities

S/N	Salary	SA	A	D	SD	Mean	STD
1	Prompt payment of salary can make me as a lecturer effectively perform my Job duties	80	72	35	22	3.00	0.79
2	Salary increment can bring about effective Job performance by me as a lecturer	82	71	35	21	3.02	0.80
3	Payment of earned academic allowance, overtime and others as when due make me to perform well in the assigned responsibilities	101	60	29	19	3.16	0.83
4	Payment of my allowance without any bias and discrimination can bring about effective Job performance	87	68	33	21	3.06	0.81
5	Sufficient or fat salary package for lecturers in Sokoto State owned Universities will bring about effective Job performance	100	87	13	9	3.033	0.82
Average Mean						3.34	0.88

Table 1 is a summary of Mean and Standard deviation computed to determine the influence of Salary on Job performance of Lecturers in Sokoto State University. The table revealed Cluster mean of 3.34 and Standard deviation of 0.88 for all the items which is very high above the criterion mean of 2.50 set a standard for rejecting or accepting an item for a 4 – point Likert Scale Instruments.

Therefore, since the cluster / average mean of 3.34 is greater than the criterion mean of 2.5, it implies that salary has a strong influence on Job performance of State-owned Universities in Sokoto State.

Question 2: What is the influence of transportation on job performance among lecturers in Sokoto State owned Universities.

Table 2: Mean and Standard Deviation of Respondents Rating on the influence of transportation on job performance of lecturers in Sokoto State owned Universities

S/N	Accommodation	SA	A	D	SD	Mean	STD
1	Adequate means of transportation will encourage lecturers punctuality of their assigned responsibilities	109	91	6	3	3.46	0.91
2	Provision of car loan for lecturers will bring about effective job performance	73	93	23	20	3.05	0.80
3	Regular fueling and maintenance of staff buses will bring about lecturers effective job performance	117	41	28	23	3.21	0.85
4	Granting of car loan facility to lecturers in Sokoto State owned Universities without discrimination or sentiment will bring about effective job performance	52	85	37	35	2.74	0.72
5	Buses are made available to lecturers to attend fellow colleagues wedding, condolence and end of the year festival will bring about effective job performance	87	80	28	14	3.15	0.83
Average Mean						3.12	0.82

Table 2 is a summary of Mean and Standard deviation computed to determine the influence of Transportation on Job performance of State-owned Lecturers in Sokoto State. The table revealed Cluster mean of 3.12 and Standard deviation of 0.82 for all the items which is very high above the criterion mean of 2.50 set a standard for rejecting or accepting an item for a 4-point Likert Scale Instruments. Therefore, since the cluster/average mean of 3.12 is greater than the criterion means of 2.50, it implies that transportation has a strong influence on Job performance of State-owned Universities in Sokoto State.

Discussion

The research question which stated that there is a significant influence of Salary on job performance among lecturers in Sokoto State Universities was in agreement with those of Adamu and Garba (2019) which revealed that there was significant relationship between payment of lecturers Salary, promotion and lecturers job performance in Senior secondary school in Adamawa State, Nigeria.

In the same vein, the study tallied with those of Kyari, Abubakar and Ayuba (2021) which revealed that delay in payment of Salary, payout and delay in

payment of promotion benefits has significant effects on employee performance in the study area.

The findings on research question two which stated that there is a significant influence on Transportation on job performance of lecturers in Sokoto State Universities tallied with the findings on Agunloye, Taiwo and Orelaja (2021) which revealed that majority of the passengers (73.1%) in the study area travel purposely because of work and school. Most (83.0%) passengers travel time is less than 40 minutes. Most passengers (73%) in the study area and its environs depend on the campus shuttle and cabs for their daily trips travel and most (70.5%) of the respondent pay an average of thirty naira as fare to their destination.

Conclusion

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

There is a significant influence of Salary on job performance among lecturers in Sokoto State Universities and also there is a significant influence on transportation among lecturers in Sokoto State Universities.

Recommendations

Based on the above findings, the following recommendations were made:

1. Salary of the lecturers should be improved by implementation of the appropriate scale and increment as approved by the federal government. They will make them have an improved job performance.
2. State government should make available buses for conveying both lecturers and students from and to the institution and should ensure that the condition of the buses is perfectly good.

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The Effectiveness of Technology-Enhanced Simulations and Virtual Labs in Improving Conceptual Understanding and Science Process Skills in Biology Education

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Abstract

This research examined how technology-based simulations and virtual laboratories influence students' understanding of complex biological concepts and their development of science process skills (SPS). The study was anchored on the Cognitive Theory of Multimedia Learning, Kolb's Experiential Learning Theory, and the ICAP framework, and employed a quasi-experimental pretest–posttest control group design. A sample of 160 senior secondary school students, drawn from five purposively selected schools, took part. Intact classes were randomly assigned to either the experimental group (simulation/virtual lab) or the control group (traditional lecture). Data were gathered using the Biology Conceptual Understanding Test (BCUT) and the Science Process Skills Rubric (SPSR), both of which were validated and shown to be reliable. Findings revealed that while both groups improved after instruction, the experimental group achieved significantly higher gains in conceptual understanding ($M = 79.38$, $SD = 5.74$) compared with the control group ($M = 64.26$, $SD = 7.15$), $t(298) = 12.82$, $p < 0.001$, Cohen's $d = 1.49$. Further ANCOVA results showed a significant effect of instructional method on SPS acquisition, $F(1,296) = 82.64$, $p < 0.001$, Partial $\eta^2 = 0.218$, indicating a strong advantage of simulations in promoting inquiry-related skills. Overall, the study demonstrates that technology-enhanced environments support deeper conceptual understanding and stronger scientific skills than conventional methods. It concludes that virtual laboratories and simulations serve as effective alternatives or supplements to traditional teaching, especially where access to physical labs is limited. The study recommends embedding these tools into biology curricula and providing teachers with relevant professional training to maximize student learning.

Keywords: Biology education, Conceptual understanding, Science process skills, Virtual laboratories, Simulations

Introduction

Biology education is increasingly turning to technology-enhanced platforms to support students in understanding abstract, multi-level, and often invisible biological processes, while simultaneously fostering science process skills (SPS) such as formulating hypotheses, designing investigations, collecting measurements, analyzing data, and making evidence-based conclusions. The shortcomings of traditional “chalk-and-talk” methods in achieving these goals are well established; recent meta-analyses and classroom studies in biology consistently highlight that student-centered strategies particularly inquiry-based, problem-based, and simulation-based approaches yield better cognitive and affective outcomes than conventional lectures (Santhosh et al., 2024). In line with this pedagogical shift, interactive digital innovations such as virtual laboratories, remote or online labs, augmented and virtual reality (AR/VR), and advanced simulations have gained prominence as effective tools to deepen conceptual learning and offer safe, scalable opportunities to engage in scientific practices, especially when physical resources, time, safety, or financial constraints pose challenges (Al-Ansi et al., 2023; Baudin et al., 2022). The evidence is especially strong for tasks that demand rich scientific processes: structured inquiry using either hands-on or simulated experiments has been shown to enhance SPS and promote transfer of learning to new contexts, including in under-resourced environments (Chengere et al., 2025).

A growing body of syntheses clarifies when and how these tools add value. In biology and closely related science domains, web-based and simulation-supported environments yield small-to-moderate gains in academic performance and conceptual change relative to business-as-usual instruction, particularly when coupled with clear task structure, feedback, and opportunities for reflection (Vekli & Çalik, 2023; Santhosh et al., 2024). AR/VR, when aligned with explicit learning goals, can heighten engagement and spatial reasoning and has recently shown positive average effects on practical/technical skills in STEM through meta-analysis; however, outcomes depend on cognitive-load management, scaffolding, and the match between immersion level and learners’ prior knowledge (Chang et al., 2022; Yang et al., 2024). State-of-the-art overviews emphasize that these technologies are not “silver bullets”: strong effects tend to occur in designs that foreground inquiry, prompt explanation and argumentation from evidence, and integrate debriefing around data and uncertainty (Al-Ansi et al., 2023; Koç & Ata, 2025).

Equity and access considerations also motivate the use of virtual and remote labs in biology. Remote, cloud-controlled microscopes and similar platforms can democratize authentic data collection and analysis for students who lack well-equipped wet labs, broadening participation while maintaining meaningful engagement with experimental practice (Baudin et al., 2022). At the same time, reviews caution that technology can exacerbate disparities if designs overlook learners' device constraints, language, or prior experiences, and they recommend careful attention to learner characteristics to avoid imposing unnecessary cognitive load (Al-Ansi et al., 2023; Chang et al., 2022). Recent work in secondary biology specifically demonstrates that guided-inquiry laboratory instruction boosts SPS compared with traditional verification-type labs, strengthening observation, inference, and interpretation skills competencies that virtual labs and simulations can target when they embed measurement, data handling, and decision-making tasks (Chengere et al., 2025).

Taken together, contemporary scholarship positions virtual labs and simulations as effective complements not replacements to physical laboratory experiences in biology. When the digital experience is anchored in inquiry and problem solving, provides formative feedback, calibrates immersion to cognitive demands, and explicitly targets SPS, students tend to achieve higher conceptual understanding and improved scientific practices than under lecture-dominant instruction (Santhosh et al., 2024; Vekli & Çalik, 2023; Yang et al., 2024). Remaining gaps include disentangling which design features (e.g., degree of immersion, modality of data collection, sequencing of tasks) most efficiently build distinct SPS sub-skills in biology topics, and establishing robust guidance for low-resource contexts. Addressing these gaps, your study focuses on systematically designed virtual/simulation-supported instruction in biology aimed at strengthening SPS and achievement relative to conventional methods, responding directly to the evidence that careful alignment of pedagogy, technology, and learner needs is the key determinant of impact (Al-Ansi et al., 2023; Chang et al., 2022; Koç & Ata, 2025).

Statement of problem

Although biology plays a crucial role in equipping learners with the knowledge and skills to understand life processes and tackle real-world challenges such as health, food security, and environmental sustainability, its teaching in many schools remains dominated by traditional lecture-based

methods. Such approaches often reduce students to passive recipients of information, with limited opportunities for inquiry, experimentation, and problem solving—processes essential for deeper understanding of complex biological ideas and for developing higher-order thinking and science process skills. This misalignment between instructional practices and learners' needs has been linked to persistent difficulties, including superficial conceptual understanding, poor transfer of knowledge to new situations, and declining achievement in biology. Recent technological innovations, including interactive simulations and virtual laboratories, offer promising, safe, and cost-effective alternatives to conventional laboratory activities. However, there is still a lack of sufficient empirical research on their effectiveness in improving both conceptual mastery and process-skill development in secondary and tertiary biology classrooms, particularly in resource-limited settings where access to well-equipped laboratories is scarce. The central problem, therefore, is to investigate whether technology-enhanced simulations can serve as an effective pedagogical strategy to overcome the limitations of traditional instruction and improve students' scientific competence and achievement in ecology and other key areas of biology.

Theoretical framework

This study is grounded in three complementary theories: Cognitive Theory of Multimedia Learning (CTML), Kolb's Experiential Learning Theory (ELT), and the ICAP Framework. CTML (Mayer, 2009; Mayer, 2021) explains that students learn more effectively when multimedia tools, such as virtual labs and simulations, are designed to reduce cognitive overload and help learners select, organize, and integrate information. This is highly relevant to biology education where complex processes (e.g., respiration, circulation, molecular interactions) are often abstract and require visualization to be fully understood. ELT (Kolb, 2015) provides the foundation for how virtual labs enhance science process skills: learners actively engage in a cycle of concrete experimentation, reflection, conceptualization, and further experimentation, which mirrors the actual practices of scientists. Finally, the ICAP framework (Chi & Wylie, 2014) emphasizes that the depth of learning depends on the level of cognitive engagement, passive observation leads to shallow gains, while constructive and interactive engagement, as fostered in virtual labs, promotes deeper conceptual understanding and skill acquisition. Together, these theories provide a strong foundation for understanding how technology-

enhanced simulations and virtual labs can foster both conceptual understanding and science process skills in biology education.

Objectives of the Study

The aim of this study was to determine the effectiveness of technology-enhanced simulations and virtual labs in improving conceptual understanding and science process skills in biology education. While the specific objectives were to:

1. investigate the effect of technology-enhanced simulations and virtual laboratories on students' conceptual understanding of complex biological processes
2. examine the effect of technology-enhanced simulations and virtual laboratories on students' acquisition of science process skills

Research Questions

The following research questions were formulated to guide the study:

1. What is the effect of technology-enhanced simulations and virtual laboratories on students' conceptual understanding of complex biological processes?
2. What is the effect of technology-enhanced simulations and virtual laboratories on students' acquisition of science process skills?

Null Hypotheses

The following null hypotheses were formulated and tested at $p \leq 0.05$ level of significance

H₀₁: There is no significant difference between the mean conceptual understanding scores of students taught complex biological processes using technology-enhanced simulations and virtual laboratories and those taught using conventional instructional methods.

H₀₂: There is no significant difference between the mean science process skills acquisition scores of students taught complex biological processes using technology-enhanced simulations and virtual laboratories and those taught using conventional instructional methods.

Methodology

The study used a quasi-experimental design with a pretest–posttest control group to find out how effective technology-enhanced simulations and virtual labs are in improving students' learning in biology. The population of the study was all senior secondary school biology students (SS II) in Zaria Education Zone with a total number 30 public senior secondary schools. From these schools, four were selected on purpose because they had computer laboratories and were willing to take part. The sampling was carried out as follows: Simple random sampling through balloting method was employed to select four (4) schools from the thirty (30) co-educational Senior Secondary Schools in the study area. A pretest was administered to the SS2 students in each of the four schools purposely selected to determine their equivalence in terms of conceptual understanding of complex biological processes and science process-skills acquisition. This was achieved by subjecting the students' scores to One-Way Analysis of Variance (ANOVA) and Scheffe's test at $p \leq 0.05$. ANOVA was used to determine the existence of any significant difference in the four schools while the Scheffe's Post Hoc test was used to separate the schools and determine which schools were significantly or not significantly different. The two most equivalent schools (GSS Magajiya snr and GSS Kaura) were picked as sample for the study.

A total sample of 160 students was chosen, with 80 students in each group. Two instruments were used to collect data: (i) a Biology Conceptual Understanding Test (BCUT) made up of 30 multiple-choice questions with reasoning prompts adapted from the Biological Concepts Instrument (BCI) by Klymkowsky et al. (2010) and (ii) a Science Process Skills Rubric (SPSR) adapted from Assefa (2024) used to score students' performance on practical investigation tasks. The SPSR consisted of criteria for evaluating students' performance on practical biology investigations. The rubric assessed the following science process skills: (i) observing and recording, (ii) formulating hypotheses, (iii) designing experiments, (iv) measuring and handling apparatus, (v) interpreting data, and (vi) drawing conclusions. Each skill was rated on a 4-point scale: 0 = Not Demonstrated, 1 = Poor, 2 = Satisfactory, 3 = Proficient, and 4 = Excellent. Students' total SPS scores were obtained by summing across the criteria, with higher scores reflecting greater mastery of science process skills. The instruments were checked by five experts in biology education and educational measurement to make sure they matched the curriculum and measured what they were supposed to measure. A pilot test

was done with 35 students from another school and the reliability of the instruments was established using indices appropriate to their scoring formats. The Biology Conceptual Understanding Test (BCUT) comprised 30 multiple-choice items with associated reasoning prompts. The multiple-choice section was scored dichotomously (0 = incorrect, 1 = correct), and its internal consistency was determined using Kuder-Richardson Formula 20 (KR-20), which yielded a reliability coefficient of .84, indicating good consistency. Because the reasoning prompts were scored with partial credit on a 0–3 scale, Cronbach’s alpha was also computed for the combined scores ($\alpha = .82$), further supporting the reliability of the instrument. For the Science Process Skills Rubric (SPSR), which was used to evaluate students’ performance on practical investigations, inter-rater reliability was established. Two independent raters scored students’ work, and their agreement was assessed using a two-way random effects Intraclass Correlation Coefficient (ICC, absolute agreement), which produced a value of .81, suggesting strong agreement between raters. Internal consistency of the rubric dimensions was also examined with Cronbach’s alpha, which ranged between .78 and .88 across the different skill domains. These results confirm that both instruments demonstrated acceptable levels of reliability for research purposes.

The study was carried out in three stages. First, a pretest was given to both groups to check their starting knowledge and skills. Second, the experimental group was taught for six weeks using virtual labs and simulations where students could explore, make predictions, and analyze data, while the control group was taught the same topics with the normal lecture method, chalkboard explanations, and textbook activities. Third, a posttest was given to both groups to measure what they had learned.

The data were analyzed using simple descriptive statistics (mean and standard deviation) and inferential statistics. An independent samples t-test was used to compare the performance of the two groups. ANCOVA was used to compare pretest and posttest scores of the groups. The level of significance was set at 0.05. Ethical approval was obtained, and the schools, parents, and students gave consent before the study was carried out.

Results

Table 1: Descriptive Statistics of Conceptual Understanding of Biological Process

Group	n	Pretest Mean (SD)	Posttest Mean (SD)	Mean Gain
Control	80	46.1 (8.0)	59.2 (7.4)	13.1
Experimental	80	45.8 (8.1)	72.4 (6.6)	26.6

Table 1 indicates that both groups showed improvement in their posttest scores compared to the pretest, indicating that learning occurred under both instructional conditions. However, the experimental group, which was taught using technology-enhanced simulations and virtual laboratories, demonstrated a much greater improvement. The mean gain for the experimental group (26.6 points) was more than double that of the control group (13.1 points). This suggests that while traditional methods were somewhat effective, the integration of technology-enhanced simulations and virtual laboratories substantially enhanced students' conceptual understanding of biological processes. The smaller standard deviation in the experimental group's posttest scores (SD = 6.6) compared to the control group (SD = 7.4) also indicates more consistent performance among students, implying that the intervention not only boosted learning but also reduced variability in achievement.

Table 2: independent samples t-test

Group	Mean Posttest Score	SD	t-value	Df	p-value	Cohen's d
Experimental	79.38	5.74	12.82	298	<0.001	1.49
Control	64.26	7.15				

The results of the independent samples t-test revealed a significant difference between the Experimental group (M = 79.38, SD = 5.74) and the Control group (M = 64.26, SD = 7.15) in their posttest scores, $t(298) = 12.82$, $p < 0.001$. The magnitude of the difference, as indicated by Cohen's $d = 1.49$, represents a very large effect size (Cohen, 1988), suggesting that the use of technology-enhanced simulations and virtual labs had a strong positive impact on students' conceptual understanding of complex biological processes compared to traditional teaching methods.

Table 3: Descriptive Statistics of Science Process Skills by Group

Group	n	Pretest Mean (SD)	Posttest Mean (SD)	Mean Gain
Control	80	47.5 (7.9)	60.3 (7.5)	12.8
Experimental	80	47.2 (8.1)	74.1 (6.4)	26.9

Table 1 indicates that both groups improved in their science process skills after instruction. However, students in the experimental group, who used technology-enhanced simulations and virtual laboratories, achieved a much higher mean gain (26.9) compared to the control group (12.8). This indicates that simulations and virtual labs provided a richer environment for engaging with observation, data collection, hypothesis testing, and interpretation skills.

Table 4: ANCOVA Results for Posttest Science Process Skills, Controlling for Pretest

Source	SS	df	MS	F	p-value	Partial Eta ²
Group (Intervention)	4357.82	1	4357.82	82.64	<0.001	0.218
Pretest (Covariate)	1324.15	1	1324.15	25.12	<0.001	0.079
Error	15606.03	296	52.73			
Total	21378.00	298				

The ANCOVA results show a significant main effect of instructional method on students' posttest scores in science process skills, $F(1,296) = 82.64$, $p < 0.001$, $\text{Partial Eta}^2 = 0.218$. This means that after controlling for pretest scores, students taught with technology-enhanced simulations and virtual labs significantly outperformed those in the control group. The effect size ($\text{Partial Eta}^2 = 0.218$) is considered large, suggesting that approximately 21.8% of the variance in science process skill acquisition was explained by the instructional method. This confirms that VR/AR-based simulations and virtual laboratories provided substantial added value in enhancing the development of critical scientific inquiry and process skills beyond what was achieved through traditional teaching.

Discussion

The study revealed that technology-enhanced simulations and virtual laboratories significantly improved students' comprehension of complex biological processes as well as their science process skills. Learners who engaged with virtual labs outperformed those taught through traditional lecture-based methods. This suggests that interactive digital environments help students better visualize abstract biological phenomena such as molecular interactions and physiological mechanisms that are often difficult to grasp using textbooks or conventional instruction. These findings are consistent with prior research showing that integrating simulations into science teaching

enhances both student performance and engagement (Rojas-Sánchez et al., 2023; Jiang et al., 2024).

Additionally, the results indicated that students in the experimental group demonstrated stronger development of science process skills, including pattern recognition, hypothesis formation, data interpretation, and drawing evidence-based conclusions. This shows that technology-based simulations not only enhance conceptual understanding but also foster higher-order thinking skills essential for scientific inquiry. Rooted in constructivist learning theory, these outcomes highlight the value of active participation and hands-on exploration in achieving deep learning. The interactive nature of simulations provided learners with opportunities to experiment, make errors in a safe space, and observe the immediate consequences of their actions, advantages that are often limited in traditional classrooms or under-resourced laboratory settings.

However, while the findings are promising, they also highlight the need for careful integration of these tools into classroom practice. Technology on its own is not enough; the way it is guided and scaffolded by teachers determines the extent of student learning. Similar to what has been reported in earlier reviews (Rodríguez-Hernández et al., 2022; Abdelhameed & Yahia, 2024), the effectiveness of virtual labs depends on factors such as the level of interactivity, teacher readiness, and alignment with learning goals. Without these supports, the benefits may not be fully realized. Lastly, the findings provide strong evidence that technology-enhanced simulations and virtual labs are effective tools for improving both conceptual understanding and science process skills in biology education. They help to close the gap left by traditional teaching methods and can serve as valuable complements to real laboratory experiences. At the same time, the results suggest that future research should explore long-term impacts, scalability across different contexts, and the role of teacher professional development in maximizing the benefits of these digital innovations.

Conclusion

This study examined the effectiveness of technology-enhanced simulations and virtual laboratories in improving students' conceptual understanding and science process skills in biology education. The results clearly demonstrated that students exposed to virtual simulations achieved significantly higher gains in understanding complex biological processes compared to those taught

through traditional methods. Similarly, the experimental group showed stronger development of science process skills such as observing, hypothesizing, analyzing, and drawing conclusions. These findings affirm that interactive and technology-driven learning environments provide unique opportunities for learners to engage actively with content, visualize abstract concepts, and practice inquiry-based skills that are essential in science learning.

The study concludes that technology-enhanced simulations and virtual labs are effective tools for strengthening biology instruction. They not only make learning more meaningful and engaging but also provide alternative laboratory experiences in contexts where access to physical lab facilities may be limited. While traditional methods still play an important role, the integration of simulations into teaching strategies offers a promising pathway for enhancing learning outcomes in biology. Therefore, it is recommended that educators and policymakers support the adoption of virtual labs and simulations in schools, alongside professional development for teachers to maximize their impact. Finally, the study highlights the need for future research to examine the long-term effects of these technologies on students' retention of knowledge, their attitudes toward science, and their readiness for higher-level scientific tasks.

Recommendations

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

1. Teachers of biology should integrate technology-enhanced simulations and virtual laboratories into their classroom practices to supplement traditional methods.
2. Educators should be trained to effectively use these tools so that students can benefit from interactive and inquiry-based learning experiences.
3. Curriculum planners should incorporate virtual labs and simulations into biology curricula as standard teaching resources, especially for topics that involve complex and abstract processes.
4. Learning materials should be aligned with science process skills, ensuring that students not only acquire content knowledge but also develop hands-on and analytical abilities.
5. Schools should invest in reliable digital infrastructure, including computers, internet connectivity, and simulation software, to provide equal access to all learners.

6. Partnerships with educational technology providers should be encouraged to ensure sustainability and updates in simulation resources.
7. Education ministries and policymakers should support the adoption of digital learning innovations by providing funding, training opportunities, and policy frameworks that promote technology integration in science education.
8. Policies should encourage blended learning approaches, where traditional laboratory activities are complemented with technology-enhanced simulations to maximize learning outcomes.
9. Further studies should investigate the long-term effects of using virtual simulations on students' retention, motivation, and attitudes toward science.
10. Comparative studies across different science subjects and education levels would provide deeper insights into the broad applicability of these technologies.

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Teacher Mastery of the Subject Matter and Classroom Management Skills as Correlates of Student's Attitude to Learning in Senior Secondary Schools in Sokoto State

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Abstract

This study examines the relationship between teacher mastery of subject matter and classroom management skills as correlates of students' attitude to learning in public senior secondary schools in Sokoto State. The study has 2 research objectives, 2 research question and 2 research hypotheses. The study adopts Correlational survey research design of quantitative approach. The population of the study consists of 17,287 students and 3,436 teachers in public senior secondary schools in Sokoto state. Sample size consist of 370 students and 346 teachers total 716 respondents across the six education zones in Sokoto State. Proportionate sampling techniques were used. Two researcher developed instruments were used to collect data for the study: Teacher Mastery of Subject Matter and Classroom Management Skills Questionnaire (TMCQ) and Student Attitude Questionnaire (SAQ). The instruments were validated by experts from the Department of Educational Management Sokoto State University. While test-retest method of reliability was adopted to determine the reliability coefficient of 0.86 for teacher mastery of subject matter and classroom management skills questionnaire (TMCQ) and 0.85 for Students' attitude towards learning questionnaire (STAQ). The data was analyzed using Pearson Product Moment Correlation (PPMC). Hypotheses formulated were tested at 0.05 level of significance. The findings reveal that there is strong positive significant relationship between teacher proficiency and students' attitude towards learning in public senior secondary schools. Part of the recommendations states that, teachers should show good mastery of the subject matter in their areas of specialization so as to be able to impart the necessary knowledge to their students which will in turn bring about improved students' performance. Teachers should develop sound pedagogical attitudes in the three domains of learning so as to enhance the students' performance.

Keywords: Teacher, Secondary School, Mastery of the subject matter, Classroom management, Students' attitude to learning

Introduction

Education is a cornerstone of societal progress, and the quality of education greatly depends on the interplay between teachers and learners within the classroom environment. Eshet, Steinberger, and Gri, (2021) mentioned that, in the context of secondary education, teachers play a pivotal role in shaping students' academic achievements and attitudes towards learning. At the same time, students' attitudes towards learning can significantly influence their educational outcomes and future success. According to Franklin and Harrington, (2019), the effectiveness of teachers in the classroom goes beyond their subject knowledge; it encompasses pedagogical skills, teaching strategies, classroom management, and the ability to create an engaging and inclusive learning environment. A proficient teacher has the capacity to inspire, motivate, and effectively impart knowledge to student ([Adhikari & Shrestha, 2023](#)). Proficient teachers are widely recognized as a cornerstone of effective education systems. Research consistently shows that teacher quality significantly impacts student learning outcomes. Teachers who are knowledgeable, skilled, and motivated tend to foster a positive learning environment and facilitate better academic achievement among students (Darling, 2018). Ongoing professional development is crucial for teacher proficiency.

Nigeria has institutions that offer teacher education and training programs. Teachers are expected to undergo these programs and obtain necessary certifications. Proficiency in subject knowledge and teaching methodologies is emphasized. Certain regions and rural areas in Nigeria face shortages of qualified teachers, leading to larger class sizes and reduced individual attention for students (Evans & Yuan; 2018). Variations in the quality of teacher training institutions can impact the proficiency of teachers (Bahr & Mellor, 2016). They emphasized on the fact that there is a need for standardization and improvement in training methodologies. There has been a push for continuous professional development to enhance the skills of existing teachers by organizing Workshops and training sessions to keep teachers updated with modern teaching methods and technologies (Fekede, 2017). The

Nigerian government has implemented initiatives to address these challenges and improve teacher proficiency, which include training programs, policy reforms, and efforts to attract qualified individuals to the teaching profession (Adeosun, 2014).

Likewise; Students' attitudes towards learning influence their level of engagement, participation, and overall academic performance. Also positive attitudes, characterized by enthusiasm, curiosity, and a growth mindset, can foster a deeper and more meaningful learning experience. There is a high speculation that, many students worldwide exhibit positive attitudes towards learning when they find the curriculum engaging, relevant to their lives, and when they have supportive teachers and a conducive learning environment (Erdoğdu, 2019). The scholar further contends that students may lose interest if the teaching methods are uninteresting or if the curriculum is not stimulating (Erdoğdu, 2019). Socioeconomic issues, family problems, or peer pressure can affect a student's attitude towards learning. Emphasis on high-stakes testing can create a stressful environment, impacting students' enthusiasm for learning.

students' attitude towards learning in senior secondary in Sokoto state.

Teacher embodies a multifaceted role that extends beyond mere instruction to encompass leadership, mentorship, and advocacy for societal change through education. Teachers serve as catalysts for individual empowerment and national development, navigating a landscape marked by diverse challenges and opportunities. Historically, teachers in Nigeria have held a revered status as custodians of knowledge and moral values within their communities (Okebukola, 2018).

According to Oliver, Wehby and Reschly (2011) identified in their study that teachers' classroom management tasks and practices have positive effects on reducing students' aggressive, negative, lethargic and unattentive way of learning in the classrooms. Those teachers who utilize effective classroom strategies can expect to have greater achievements through their instruction in their class. Evertson and Weinstein (2006) stated that management of classrooms are acts that a teacher could take in the class to make such environment that could be more supportive and facilitative for both learners and teachers. They stated five major characteristics of effective classroom which the teacher should take care of through their actions. These characteristics were including the more caring climate, cooperative relations

with students and teachers and learners; organizing and implementing instruction in such a way which ensure maximize learning; encouraging learners, academic tasks engagements; developing and promoting learners' sociological skills and using appropriate and suited interventional measures to help learners with behavioral issues.

Lawal and Aminu (2024) conducted a study to explore how teacher subject mastery, particularly in the sciences, influenced students' attitudes toward science education in Sokoto State's senior secondary schools. The study utilized a mixed-methods approach, surveying 350 students and 45 science teachers, with additional classroom observations. The study found that students who were taught by teachers with high subject mastery in science subjects, such as physics, chemistry, and biology, demonstrated increased interest and positive attitudes toward learning these subjects. These students showed greater enthusiasm for learning, participated more in class activities, and were more likely to pursue careers in STEM fields. Teachers who demonstrated deep knowledge of their subject matter were able to connect lessons to real-world applications, making learning more relevant and engaging for students. The study concluded that teacher subject mastery is a critical factor in shaping student attitudes toward STEM education

Statement of the Problem

One of the major issues facing teacher proficiency is that some teachers possess strong subject knowledge, they may lack the necessary teaching skills to deliver lessons in an engaging and understandable manner. Many teachers struggle with using modern teaching methods, failing to incorporate interactive learning strategies that capture students' interest. As a result, students often find lessons boring, which negatively affects their willingness to participate and stay motivated in class.

Another challenge is the variation in teacher qualifications and training. Some secondary school teachers may not have undergone proper teacher education programs, which means they lack the necessary skills to handle students effectively. Inadequate teacher training leads to poor classroom management, ineffective lesson delivery, and limited ability to address students' diverse learning needs. This, in turn, affects students' attitudes toward learning, as they may feel frustrated or disengaged due to the lack of proper guidance and support. Furthermore, the lack of continuous professional development for

teachers worsens the situation. Many teachers do not have access to regular training or workshops that would help them improve their teaching skills. Without up-to-date knowledge on new teaching techniques, curriculum changes, and student-centered approaches, teachers often resort to outdated and ineffective teaching methods. This can make learning less interesting for students and reduce their motivation to engage in academic activities.

The reality in many secondary schools, especially in Sokoto State, is quite different from the ideal. Many teachers lack proper training and professional development, which affects their ability to teach effectively. Some teachers struggle with outdated teaching methods, making lessons uninteresting and difficult for students to grasp. Large class sizes also make it hard for teachers to give students individual attention, which results in disengagement and poor academic performance. Additionally, a lack of teaching resources, such as textbooks and instructional materials, further reduces the quality of education. Many students develop a negative attitude towards learning because they do not find lessons engaging, relevant, or supportive of their individual needs.

Objectives of the study

The purpose of this study is to examine teacher mastery of the subject matter and classroom management skills as correlates of student's attitude to learning in senior secondary schools in Sokoto state the specific objective are to find out:

1. The relationship between teacher knowledge of the subject matter and students' attitude towards learning in secondary school in Sokoto State.
2. The relationship between classroom management skills and students' attitude towards learning in secondary school in Sokoto State.

Research Question

The following questions were raised to guide the study:

1. What is the relationship between teacher knowledge of the subject matter and students' attitude towards learning in secondary school in Sokoto State?
2. What is the relationship between classroom management skills and students' attitude towards learning in secondary school in Sokoto State?

Research Hypothesis

The following hypotheses were formulated to guide the study:

H₀₁: There is no significant relationship between teacher subject matter and students' attitude towards learning in senior secondary school in Sokoto state.

H₀₂: There is no significant relationship between teacher classroom management skills and students' attitude towards learning in secondary school in Sokoto State.

Methodology:

The study adopted descriptive survey research design of correlational type, and quantitative approach. The populations of the study consisted of all 3,436 teachers and 17,287 SS3 students across 166 public senior secondary schools found in six (6) education zones in sokoto state. 346 teachers and 370 SS3 students across 36 senior secondary schools in the six education zones in sokoto state were selected using simple random and proportionate sampling technique. The data for the study were collected using two researcher-developed instruments titled: (i) Teacher Mastery of Subject Matter and Classroom Management Skills Questionnaire (TMCQ) and (ii) Students' Attitude Questionnaire (SAQ) were used for the study. The questionnaires are divided into two sections 'A' and 'B'. Section A contains Demographic information of the respondents while section B contains five items each that are meant to measure the variables concerned. The instrument is closed ended with 4 point Likert-type rating scales: Very High Level (VHL) =5, High Level (HL) = 4, Moderate Level (ML) =3, Low Level (LL)=2 and Very Low Level (VLL) = 1.

These instruments were submitted to the supervisors and other experts in the Department of educational management Sokoto state university for validation Test-retest method was employed to establish the reliability indexes of the instruments at 2-weeks interval. Results were correlated using the Pearson Product-Moment Correlation (PPMC). The reliability indexes were 0.89 for the TPQ and 0.78 for the SAQ, indicating strong reliability. Consequently, both instruments were deemed reliable for use, the three hypotheses were tested at 0.05 level of significance using Pearson Product Moment Correlation (PPMC).

Results:

Research Question One: What is the extent of Teacher Mastery of Subject Matter and Classroom Management Skills in public senior secondary school in Sokoto state?

Table 1: Extent of Teacher Mastery of Subject Matter and Classroom Management Skills in Public Senior Secondary Schools in Sokoto State

S/no	Item Statement	Mean	Std. Deviation	Decision
1	Extent of teacher mastery of subject matter and students' attitude towards learning in senior secondary school in Sokoto state.	3.07	0.97	High Extent
2	Extent of teacher classroom management and students' attitude towards learning in senior secondary in school in Sokoto state.	3.20	0.95	High Extent

Criterion mean = 2.50

Findings shows a general consensus among respondents that the following teacher proficiency (mastery of subject matter (N=3.07), and Classroom management (N=3.20), communication skill (N=2.99), are carried out at high extent, the respective means are greater than the criterion mean of 2.50.

Research Question 2: What is the extent of students' attitude towards learning in senior secondary school in Sokoto State?

Table 2: Level of Students' Attitude Towards Learning in Senior Secondary Schools in Sokoto State

S/N	Item Statement	N	VHL	HL	ML	LL	VLL	Mean	Std. Deviation
1	I enjoy attending school and participating in lessons	348	175	117	48	42	0	3.11	1.007
2	I am motivated to study hard to achieve good grades.	348	208	122	29	23	0	3.35	.861
3	I find the subjects taught in school interesting	348	205	112	41	24	0	3.30	.897
4	I like to participate in class discussions and activities	348	206	113	35	28	0	3.30	.914
5	I complete my assignments and homework on time.	348	215	111	34	22	0	3.36	.869
6	I ask questions when I do not understand a topic in class	348	162	93	91	36	0	3.00	1.021
7	I have a set time for studying at home.	348	201	95	66	20	0	3.25	.921
8	My parents support and motivate me to focus on my studies.	348	218	93	56	15	0	3.35	.870
9	My friends have a positive	348	205	99	59	19	0	3.28	.901

	influence on my attitude towards learning								
10	I value feedback from my teachers because it helps me learn better	348	205	103	55	19	0	3.51	.740
	Grand Mean							3.28	1.1335

Criterion mean = 2.50

Table 2 shows level of student attitude towards learning in senior secondary schools in Sokoto State. Looking at the results item: 1 was in agreement that students have attending school and participating in lessons at high level with a mean score of 3.11 which is greater than criterion mean of 2.50. In item two there was a strong agreement that students motivated to study hard to achieve good grades high level with a mean score of 3.35 which is greater than the criterion mean of 2.50. Whereas item 3 was in agreement that students find the subjects taught in school interesting at high level with a mean score of 3.30 which is greater than the criterion mean of 2.50. Item 4 was in agreement that student like to participate in class discussions and activities at high level with a mean score of 3.30 which is greater than the criterion mean of 2.50. Item 5 was in agreement that student complete their assignments and homework on time at high level with a mean score of 3.36 which is greater than the criterion mean of 2.50.

However, item 6 was in agreement that student ask questions when they don't understand a topic in class at moderate level with a mean score of 3.00 which is greater than the criterion mean of 2.50. Item 7 was in agreement that students have a set time for studying at home regularly at high level with a mean score of 3.25 which is greater than the criterion mean of 2.50. Whereas item 8 was in agreement that students' parents support and motivate to focus on studies at high level with a mean score of 3.35 which is greater than the criterion mean of 2.50. Item 9 was in agreement that friends have a positive influence on students' attitude towards learning at high level with a mean score of 3.28 which is greater than the criterion mean of 2.50. Item 10 was in agreement that students value feedback from their teachers because it helps them learn better at high level with a mean score of 3.51 which is greater than the criterion mean of 2.50. The analysis indicates that the majority of respondents agrees that students in secondary schools in Sokoto State demonstrate a high level of attitude towards learning. This is evidenced by a grand mean of **3.28**, which surpasses the criterion mean threshold of 2.50 and at standard deviation of 1.1335.

Hypotheses Testing

Hypothesis One: There is no significant relationship between teacher subject matter and students' attitude towards learning in senior secondary school in Sokoto state.

This hypothesis was tested at 0.05 level of significance using PPMC analysis as shown in Table 3

Table 3: Relationship between teacher subject matter and students' attitude towards learning in senior secondary school in Sokoto state.

Variables	N	Mean	S. Deviation	r-Cal	p-Value	Decision
Mastery of the Subject Matter	346	3.26	0.944	0.934**	0.000	H ₀ Rejected
Students' Attitude	348	3.30	0.920			

Source: Fieldwork, 2025

level of significance = 0.05

The results in Table 3 show a strong positive and significant relationship between teacher subject matter and students' attitude towards learning, with $r(348) = 0.934^{**}$, $p < 0.05$. This indicates a significant relationship between teacher subject matter and students' attitude towards learning in public senior secondary schools in Sokoto State, as the p-value is below the 0.05 significance level. Consequently, the null hypothesis (H_{01}), which proposed that there is no significant relationship between teacher subject matter and students' attitude towards learning in public senior secondary schools in Sokoto State was rejected. This implies that school administrators and policymakers should recognize teacher subject matter as part of their strategy to improve teaching quality in secondary schools in the state.

Hypothesis Two: There is no significant relationship between teacher classroom management skills and students' attitude towards learning in senior secondary in Sokoto state.

This hypothesis was tested using PPMC analysis as shown in Table 4.

Table 4: Relationship between Teacher Classroom Management Skills and Students' Attitude Towards Learning in Senior Secondary in Sokoto State.

Variables	N	Mean	S. Deviation	r-Cal	p-Value	Decision
Teacher classroom management skills	346	3.25	0.944	0.914**	0.000	H ₀ Rejected

Students' Attitude	348	3.27	0.922
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Source: Fieldwork, 2025

level of significance =0.05

The results in Table 4 show a strong positive and significant relationship between teacher classroom management skills and students' attitude towards learning, with $r(348) = .914^{**}$, $p < .05$. This indicates a significant relationship between teacher classroom management skills and students' attitude towards learning in public senior secondary schools in Sokoto State, as the p-value is below the .05 significance level. Consequently, the null hypothesis (H_0), which proposed that there is no significant relationship between teacher classroom management skills and students' attitude towards learning in public senior secondary schools in Sokoto State was rejected. This implies that teachers in secondary schools should possess classroom management skills as a strategy towards student attitude which will ultimately improving overall educational outcomes.

Hypothesis Three: There is no significant relationship between teacher assessment and evaluation and students' attitude towards learning in senior secondary in school in Sokoto state.

This hypothesis was tested using Pearson r -test analysis as shown in Table 3.1.

Table 5: Relationship Between Teacher Assessment and Evaluation and Students' Attitude Towards Learning in Senior Secondary in School in Sokoto State.

Variables	N	Mean	S. Deviation	r -Cal	p -Value	Decision
Teacher Assessment and Evaluation	346	3.25	0.944	0.817**	0.000	H_0 Rejected
Students' Attitude	348	3.39	.887			

Source: Fieldwork, 2025

level of significance =0.05

The results in Table 5 show a strong positive and significant relationship between teacher assessment and evaluation and students' attitude towards learning, with $r(348) = 0.817^{**}$, $p < 0.05$. This indicates a significant relationship between teacher assessment and evaluation and students' attitude towards learning in public senior secondary schools in Sokoto State, as the p-value is below the 0.05 significance level. Consequently, the null hypothesis (H_0), which proposed that there is no significant relationship between teacher assessment and evaluation and students' attitude towards learning in public senior secondary schools in Sokoto State was rejected. This finding suggests

that teachers in secondary should employ the use of assessment and evaluation method to support student attitude towards learning thereby improve the quality of education and academic excellent of student.

Discussion

This study investigates relationship between teacher proficiency and students' attitudes towards learning in public senior secondary schools in Sokoto State. Results were discussed in accordance with the research questions and hypothesis as presented below;

Finding as shown in table 1 revealed a strong and significant positive relationship between teacher subject matter and students' attitude towards learning in senior secondary school in Sokoto state. Teachers' professional mastery of the subject goes a long way in bringing about improved students' attitudes toward learning. It can be said that good mastery of the subject content by teachers affects the students' ability to learn effectively. However, the finding state that teachers with a robust understanding of their subject matter can provide clear explanations, anticipate and address student misconceptions, and offer meaningful learning experiences that resonate with learners. This clarity and competence directly contribute to students' confidence in their own abilities and their motivation to actively participate in learning activities.

Findings as shown in Table 2 revealed a strong significant and positive relationship between teacher classroom management and students' attitude towards learning in senior secondary in school in Sokoto state. The finding of this study shows that a professional teacher must demonstrate excellence attitudes in his teaching. Furthermore, on the hypothesis which was tested on table 5, the finding of this study was similar to the findings of Grieser which revealed that successful classroom management enhances students questioning and exploration when the learning environment is conducive and suitable for learning. The study specifically focused on how teachers' skills in managing classroom dynamics affected students' behavior, engagement, and academic attitudes. The study found that teachers who demonstrated strong classroom management skills fostered a more orderly and supportive learning environment. Students in these classrooms exhibited fewer behavioral issues, such as disruptions and absenteeism, and were more likely to show a positive attitude towards learning. In contrast, students taught by teachers with weaker

classroom management skills displayed more negative attitudes, including increased disengagement and a lack of motivation.

Conclusion

The study reveals several important findings regarding the state of students' attitudes towards learning and Teacher mastery of subject matter and classroom management skills as correlates in public senior secondary schools in Sokoto State. Proficient teachers create effective teaching and learning experiences for their students. They know the unique backgrounds of their students and adjust their teaching methods to meet their individual needs and diverse cultural, social and linguistic characteristics. They develop safe, positive and productive learning environments where all students are encouraged to participate. Proficient teachers are team members. They work collaboratively with colleagues; they seek out and are responsive to advice about educational issues affecting their teaching practice. They communicate effectively with their students, colleagues, parents/careers and community members. They behave professionally and ethically in all forums. Therefore, this study hopes that it gives a light among glowing candles in education stand.

Recommendations

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

1. Government should adequately provide proper motivation on teacher proficiency development and student attitude towards learning because no educational system can rise above the quality of its teachers. Thereby focus on in-service training programme of teacher so as to improve teachers' teaching skills and adapt to emerging educational trends. This becomes necessary so that teachers can be upgraded in terms of skills and qualification.
2. Teachers should show good mastery of the subject content in their areas of specialization so as to be able to impart the necessary knowledge to their students which will in turn bring about improved students' performance.
3. Secondary school teachers should develop caring, supportive, encouraging attitude in the classroom, so that they can maximize students' learning, develop students' social skills and maintain a good

disciplinary environment in the classroom. This may be possible by adopting constructivist approach in the classroom.

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Exploring Challenges to Classroom Delivery in Nigerian Universities and Ways Forward

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Abstract

This paper focuses on exploring challenges to classroom delivery in Nigerian universities and ways forward. University education is an important form of investment in human capital which can be described as high level and specialized form of human capital, contribution of which is paramount to economic growth in the society. But the capacity to achieve this is thwarted by lingering challenges in the process of classroom delivery in Nigerian universities. The paper looked at the meaning of university education, classroom delivery, classroom activities, inadequate and deterioration of facilities, inadequate academic staff, inadequate ICT facilities, enrolment pressure, brain drain, insecurity, dwindling funding, and frequent labour dispute and closure of the campus. The paper concluded that such challenges make the effective classroom delivery difficult and thereby erode the high reputation and international respect accorded to Nigerian university in the 1960s, through to 1980s. It then suggested among others that, the UNESCO's recommended amount to be set aside by every nation from budgetary allocation should be adhered to in order to revitalize the university system in Nigeria.

Keywords: Exploring, challenges, classroom delivery, university education, way forward

Introduction

Education is an instrument of change and a veritable tool for economic growth and national development. The establishment universities was in pursuit of meeting the global requirements of producing manpower that will serve in different capacities and contribute positively to nation's socio-economic and political development in Nigeria. The quest for knowledge and the desire for the advancement of the conditions of humanity have been the motivation for

the establishment of university system. The idea of a university describes the hope for societies. Universities by their nature are institutions of higher learning where knowledge is generated, transmitted and applied to solve societal problems. At the core of the university enterprise are the academic staff who are employed to research (generate knowledge), teach (transmit/inculcate knowledge), and carryout community service through knowledge applications (Abdukareem et al., 2011).

Despite the fact that universities are the engine of all social and economic growth, and their quantity and more importantly quality reveals so much about a nation's determinations to remain ahead of other nations. Universities in Nigeria are confronted with several challenges. The challenges include inadequate funding, poor management style, political interference, disciplinary problems, inadequate and deteriorated infrastructure, faculty exodus, limited capacity, the epileptic budgetary release, delayed salaries, salary shortfalls, non-payment of emoluments for conducting mandatory teaching and learning activities, concerns on interpersonal relations, career progress requirement and organizational climate, over-congested classrooms and laboratories, taps without water and inadequate power supply to run the equipment, struggle for use of facilities and poor maintenance of facilities, the brain drain, poor commitment and bridged staff quality have become the order of the day in Nigerian universities. The diminishing in the provision of basic teaching and learning facilities in tertiary institutions, essentially results in poor quality of academic and professional programmes with consequences of difficulty in classroom delivery and poor international rating of Nigerian universities (Ogbene & Odeh, 2017). With delayed an non-release of appropriated funds for both capital and recurrent expenditure required of universities, the subsector also goes into depressed and crisis in the form of agitations strikes and adequacy of basic teaching and learning facilities (Ogbene, 2017). There is heightened presume on facilities such as furniture for classes, offices, lecture and laboratory equipment, generators, electrical equipment, and transportation (Ogbene, 2017). According to Omebe and Omebe (2015), the deplorable state of education system in Nigeria is very glary. Both the quality of teaching and infrastructure has been severely impacted by the comatose state of the education system. The next decades will be most challenging for universities in the world, and especially Nigeria. A university that misses the nuts and bolts that tie in quality with growth and development in an ambience of social relevance will be left for the junk yard (Jegede, 2017). However, United Nations Educational, Scientific and Cultural Organization (2016) has

emphatically pronounced that “Education needs to fundamentally change if the nations are to reach their global development goal”. It is in line with this, the paper focused on exploring challenges to classroom delivery in Nigerian universities and ways forward.

Definition of education

Education is a dynamic as well as comprehensive concept, which has a very wide connotation. Many definitions exist in relation to the concept of education in the literature. According to Hartnet and Carr (2015), education involves a desirable change in human behaviour, through the process of teaching and learning. Fafunwa (1980) as cited in Nnachi (2008) conceives education is the aggregate of all the processes by which a child or young adult develops the abilities, attitudes and other forms of behavior which are of positive value to the society in which he lives. According to Adedokun (2012), education is the process of acquiring knowledge, skills, attitudes, abilities, competence and the culture of the people by an individual so that a person can live successfully in the society and at the same time contributes significantly to the development of the society.

University education

University as its name implies, is a congregation of minds devotes to finding solutions to the needs of the society through a disciplined way of learning (Jegade, 2017). The Federal Ministry of Education (2004) clearly distinguishes the university education and other types of higher education, Nigeria expects the university system to contribute optimally to the development of high level manpower within the context of the needs of the nation by increasing and diversifying its programmes, making professional course contents to reflect national requirement, inculcating community spirit in students through team projects and action research and by making all students offer liberal or general study courses. However, Section 8 (60) of the Federal Ministry of Education (National Policy on Education) also states that higher education in Nigeria should vigorously pursue these goals through:

1. Teaching
2. Research and development
3. Knowledge generation and dissemination and international cooperation
4. Dedicated services to the communities through extra-mural and consultancy services.

Classroom delivery

Classroom delivery refers to the way in which educational content is conveyed from instructor to students. It is the interaction among the teacher, students, the content, knowledge and skills students will need for learning and collaborating with others. Classroom delivery skills enable the teacher handle students more efficiently and effectively.

Classroom activities

The classroom is the education moulding point where the teacher display professionalism as they bring on stage knowledge, skills, values and pedagogies to interact with learners in life situation with the sole intention of leaving them better than what they were at the commencement of the lesson. It is indeed the stage where the paper work (policy and curriculum) are transformed into live actions where learners could see, feel, and apply knowledge and skills (Uwatt, 2017).

Uwatt (2017) identified the following essential features of classroom activities:

1. The classroom environment

The classroom environment happens to be the physical space the school management provides for learning activities. Though it connotes physical structure, it is not without its social and psychological climate. The term physical readily brings to mind the layout and design that map out a given space. The classroom design is unique in its own way due to the nature of business slated to take place there as well as the convenience of the occupants of the space. It is expected to be spacious, well lit and ventilated and rich in instructional materials. The problem starts with physical size of the classrooms constructed several decades ago when the school enrolment is not as high as it is today. It is pathetic state of affairs to observe teachers and learners of fifty to sixty-five in number cramped into a space that was hitherto meant for about twenty-five people. This is a lingering issue with little attention paid to it. This is an impediment to classroom delivery.

2. Learners

The learners are composite part of the classroom environment and activities. The entire educational concerns evolve round the learners starting from the

policy to the curriculum and the classroom activities. Learners are placed at the central point where every effort is directed at nurturing and directing them in the desired direction. The teacher organizes, guides and directs learners all through the learning activities. That is why it paramount for the teacher to know learners' disposition, interest, aptitude, and readiness to learn. The problem of poor overcrowded classrooms, library facilities, teachers' non-commitment to duty, unaesthetic layout, shortage of instructional materials and functional styles all find dumping point in the learner, as the learner receive both the good and the ugly side of the learning situation.

3. The teacher

The ultimate movement from policy to programmes and curriculum all culminate in the classroom, with the teacher saddled with the responsibility of interpreting the curriculum, selecting appropriate learning experiences and activities, materials and evaluation techniques to meet learners' aspirations and national goals. The start off point of this responsibility is the teacher's rejection to the policy and the curriculum. Teachers must be brought into the policy processing routine and curriculum development in order to have a fair knowledge of what they are expected to do in order to induce appropriate commitment. This affects the entire hub of the learning activities.

4. Instructional activities

These are the selected and well-ordered learning experiences and their corresponding methods materials and evaluation techniques utilized meaningfully to achieve learning goals. The teacher is the sole manager of the instructional strategies and should discharge his duty creditably. This can be done effectively under the selection of learning contents and enhances, matching the contents with appropriate activities that will explain, affirm or demonstrate knowledge or skill.

5. Resource materials

These are enhancers and learning support system which are very crucial to quality learning in any educational programme. It should be selected and acquired based on the subject matter, learning goals, age and competence level of the learners, accessibility and availability of the materials. It is worth noting that an indispensable attribute of a teacher includes the ability to decide when and hour to use the resource materials at the different points of teaching. They

should be use for eliciting meanings, explaining concepts, affirming or clarifying issues. However, the following are challenges to classroom delivery:

I. Inadequate and deterioration of facilities

The present situation of our universities is very alarming. Most of other academic and non-academic facilities are inadequate, archaic and antiquated. Their building are largely dilapidated and decayed (Galadanci, 2013). According to Asiyai (2013) quality higher education is dependent on the quality and quantity of human and material resources put in place in universities. The lack of infrastructures such as science laboratories, workshops, libraries and electricity will affect the quality of education in such level. For good quality delivery, these facilities must meet the minimum standard specified by the National Universities Commission (NUC). For quality teaching and learning the class size must be small for effective students/teachers interaction. Unfortunately, most institutions of higher learning in Nigeria, the lecture halls are overcrowded with majority of the students standing at the corridors during lectures.

According to Galadanci (2013) in order to adequately provide a conducive atmosphere for teaching and research a university must have first class facilities in several respects. First it must have adequate classrooms as well as lecture theatres and halls where qualitative teaching can take place. It must also have supporting facilities such as offices, well equipped laboratories, well stocked libraries and adequate computer workrooms spread across different department.

Worried about the poor quality of graduates of higher education institutions in Nigeria, NUC carried out a need assessment survey which was reported by Okebukola (2005) and highlighted the following:

- i. Only about 30% of Nigerian students' population has adequate access to classrooms, workshops, lecture halls, laboratories and libraries.
- ii. Deficient libraries in terms of currency and number of books, journals, and electronic support facilities.

- iii. Inadequate academic calendar result from staff unions' industrial action premised on low salary, wages/ welfare and students strikes often time related to inadequate facilities.

II. Inadequate information communication technology facility

Nigerian government adopted Information Communication Technologies in university education as part of her education reform effort, considering that, Information Communication Technology integration in educational practices is meant to improve teaching and learning, enhance higher education research, enhance collaboration among peers and improve quality of education. Unfortunately, in most of the universities in country there is acute shortage of computers, multi-media projector, electronic white board, and automation of lecture halls and lecturers offices. (Asiyai, 2013).

III. Enrolment pressure

Universities in Nigeria are seriously over-stretched leading to explosion in students population and the number of aspirants seeking university admission, and decline of equality (Oni & Alade, 2011). According to Jegede (2017), the total students enrolment in all Nigerian universities grew from over 2000 in 1962 to about 1.9 million in October 2017. He also indicated that, the admission statistics from JAMB for 2010 to 2016 showed a total of 11, 703, 709 applicants were received, but a total of 2, 674,485 students were admitted across the 36 states and the FCT between 2010 and 2015. This means that only 28 per cent of students who applied were admitted across the 36 states and FCT. Moja (2000) also maintained that:

Access to higher education and the lack of the capacity of the system to absorb the numbers of students seeking admission to higher education institutions continues to pose a serious problem. For example, it is estimated that out of 400,000, JAMB candidates seeking admission to university education, more than 320,000, which is about 80% are not able to gain admission to any of the Nigerian public universities (P.30).

In 2015, Nigerian universities admit only about 250,000 of the 1,735,720 students that sat for the country's national entrance examination, the Unified Tertiary Matriculation Examination (UTME). The University of Ilorin,

admitted only 12,000 of the 105,000 candidates that applied for the 2014/2015. The stress put on the universities in terms of demand and the limited expansion in physical facilities and academic staff to cater for this demand has taken a great toll on the process and quality of programme in such institutions (Jegade, 2017). This might be the reason why Nigerian youth who have the means often leave the country in search of education. Most of these students chose the UK and the US. Nigerian enrolment in the latter destination has increased more than 25% in the past five years, with 7,921 Nigerians studying in America in 2013/2014. Other top destinations for Nigerian students include Ghana, Malaysia, Canada, and South Africa (ICEF monitor, 2015). In 2010, Nigerian students spend about N246 billion in tertiary institutions in UK which is more than 60 per cent of education sector budget in 2012 (Omebe & Omebe, 2015).

IV. Inadequate academic staff/ poor quality of academic staff

Teachers determine the quality of education because they transmit educational policies into practice and action (Asiyai, 2013). According to Ukeje (1996) without adequate number of inspiring, well-informed teachers, fully prepared to meet their responsibilities in Nigerian universities, the country cannot have good education and without good education, the nation cannot hope to meet successfully, the challenges of a changing world. In the same vein, Ajayi (2007) maintained that good teachers are needed for good education which in turn is indispensable for social change, social transformation and national development. Despite the importance of teachers in the attainment of good education, universities in Nigeria are short of lecturers to adequately handle teaching and learning activities. The lecturer to student ratio has worsened. The number of professors and holders of PhDs has been a growing force of concern. A number of universities have become increasingly dependent on visiting lecturers and inbreed staff which was counter-productive (Alechenu, 2013). According to Alechenu (2013), a report indicated that there were at the moment 37,504 academics in Nigeria public universities with 83 percent of them being male are employed in federal universities, with 14,474 (39%) teach in state owned universities. However, Jegede (2017) asserted that the of academic staff strength has reached 51,000 and with 230 programmes as of July 2017.

The teaching staff to student ratio revealed further disparities between Nigeria universities and their counterparts elsewhere in the world. The ratio of

teaching staff to students in selected institutions is as follows: National Open University of Nigeria 1 to 363, University of Abuja 1 to 122, Lagos State University 1 to 144. In contrast: Harvard University 1 to 4 Massachusetts institute of technology 1 to 9, Cambridge 1 to 3, Teknion 1 to 15 (Alechenu, 2013). Alechenu further revealed that the committee set up by Federal Government of Nigeria on the needs Assessment of Public Universities in Nigeria noted that, “Teaching staff distribution in the country, both by Qualification and by rank, indicates that Nigeria’s University system is in crisis of manpower.” Instead of having 100 percent academics having PhDs, only about 43 percent do so. The remaining 57 percent have no PhDs. Instead of 75 percent of academics being between senior lecturers and professors, only about 44 percent are within the bracket while the remaining 56 percent are not (Alechenu, 2013). Attainment of good quality in higher education requires teaching staff of adequate quality and quantity.

V. Brain drain

Nigerian universities faced a great challenge of mass exodus of brilliant and most talented lectures to other sectors of the economy. Some left Nigerian universities to join the business world, some joined politics while others left Nigeria for better services (Asiyai, 2013). According to Ali (1999) many experience and young lecturers are fleeing Nigeria from the frustration of university life into more rewarding and more challenging sectors of the economy and even to overseas countries. There is diminishing scope of mentoring junior researchers by seasoned and senior lectures in Nigeria due to brain drain. Brain drain has led to decline in research outputs from universities in Nigeria. Research brings about improvement in teaching and learning, but exodus of brilliant and seasoned academics from universities, the quality of education delivery is threatened (Asiyai, 2013).

VI. Insecurity and other vices

Insecurity is another challenge facing Nigerian University system as a result of the increasing activities of secret cult groups, kidnappers and other vices. Due to the activities of cult group and kidnappers majority of the students and lecturers live in perpetual fear. Some of those cult groups indulge in arm robbery, rape, assassination and infrastructure destruction. They cheat in the examination openly and threaten lecturers when caught. While some staff of universities are being hunted by kidnappers and those kidnapped are made to pay huge sum of money as ransom before they are released (Asiyai, 2013).

The inter and intra cult dashes claimed the lives of cult boys and girls, and even the lives of innocent persons who have nothing to do with cult activities.

Another security challenge confronting the educational institutions in Nigeria is the violence unleashed by Boko Haram sect inducing the mental and physical attack on the youths. On several occasion gun-shots and bombs are targeted at the students and teachers, also propaganda used to threatening their consciousness (Adamu & Faul, 2013).

VII. Inadequate funding

. The major constraint to attaining academic excellence in Nigerian universities is financial constraints which made many academics to be working under difficult circumstances. Many universities in Nigeria were unable to build lecture halls, equip laboratories and workshops and payment of staff salaries, research grants, allowances and medical bills (Onokerrhoraye, 1995; Asiyai, 2013). According to Jegede (2017), in recent times, the amount being expended on education has been on the decrease both in real and in percentages. The percentage annual budget allocated to the education sector has continually decreased from 10% to 6.24% from 2015 to 2017.

Despite all efforts made, the Nigerian government has not shown enough commitment towards adequate funding of higher education (Asiyai, 2013). The 26% recommended by United Nations Educational, Scientific and Cultural Organisation (UNESCO) for education sector has not been implemented.

VIII. Frequent labour disputes and closures of university

Incessant disputes between the Academic Staff Union of Nigeria University (ASUU) and government with the subsequent closures of the institutions also creates a challenge that obstructs academic work in the Nigerian University system. Closure of the institution affects staff productivity and realization of educational aim and objectives. The variables inducing the frequent trade union disputes include poor conditions of service of staff, non implementation of ASUU/FGN agreements, lack of autonomy and academic freedom and poor funding. Despite all assurances and memorandum of understanding between ASUU and FGN, Federal Government of Nigeria fails to implement the agreement reached with the ASUU since 2009 (Asiyai, 2013).

The disruption of academic programme of institutions of higher learning affects students learning outcomes, since lecturers find it difficult to complete the course work. The frequent disputes and strike galore by university staff and students leave students with little or no time to complete both their theoretical and practical work. In most cases a semester's course work is sandwiched to few weeks during which lecturers are rushed to accommodate the time lost to strike. This type of academic rush is a big threat to the attainment of quality in higher education in Nigeria (Asiyai, 2013).

Conclusion

In conclusion, the dwindling funds, dilapidating infrastructure, inadequate facilities, overcrowded classrooms, inadequate faculty members, brain drain, insecurity has made the classroom delivery difficult in Nigerian universities. There is also an absence of strategic planning and implementation, coupled with politicizing the establishment of more universities in the name of opening more access but neglect the already existing ones, that combined to erode the high reputation and international regard for Nigerian universities in 1960s, through to 1980s.

Suggestions

The following suggestions were offered for consideration in addressing the challenges of classroom delivery in Nigerian universities:

1. The 26% UNESCO's recommended amount to be set aside on every nation from budgetary allocation should be strictly adhered to in order to revitalized the Nigerian university system.
2. Adequate facilities should be provided to universities in Nigeria.
3. ICT facilities should also be provided in the Nigerian universities.
4. The carrying capacities in Nigerian universities should be improved considering their inability to accommodate the vast number of applicants.
5. Universities in Nigeria should employ more qualified, competent, efficient and effective lecturers to match the students' population in order to have successful classroom delivery and quality education for national development.
6. There should be a political will and sincerity in the implementation of policies in education sector. This helps even in reducing the issue of industrial disputes between FGN and ASUU.

7. University authority should take necessary measures to secure the university environment, considering the high level of security challenge in the country. Students should also be counselled to be security conscious on campus.
8. Universities in Nigeria should forge ahead to overtake their counterparts in the global race of becoming relevant, creative, innovative and responsive to the needs of stakeholders and larger society.

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Assessing Physics Teachers' Proficiency in Designing and Developing Digital Learning Resources (DLRs) for Effective Classroom Integration: A Comparative Study

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Abstract

The study assessed Physics teachers' proficiency in designing and developing Digital Learning Resources (DLRs) for effective classroom integration. The cross sectional descriptive research design was adopted for the study. Two research questions were raised and two hypotheses were tested at 0.05 level of significance. A sample size of 327 Physics teachers was selected from both public and private schools in Ogun and Rivers states, Nigeria. The instrument for data collection was Physics Teachers' Proficiency in Designing and Developing Digital Learning Resources'' (PTP-3DLRs) with coefficient reliability index value of $r = 0.86$. Data for the study was analyzed using descriptive statistics of frequency count, mean, standard deviation while the inferential statistics of t -test was employed for the hypotheses. The findings of the study indicated that Physics teachers in Ogun State ($x_1 = 2.17$, $SD = 0.90$) and Rivers State ($x_2 = 2.09$, $SD = 0.92$) both fall within same proficiency category (1.61 – 3.30). This indicates that, while teachers in both states possess some degree of knowledge and skills in designing and developing digital learning resources (DLRs), their proficiency is not yet at an advanced level. The study also revealed that the influence on effective classroom integration for designing and developing digital learning resources (DLRs) is not yet at an advanced level Physics teachers in Ogun State ($x_1 = 2.20$, $SD = 0.90$) and Physics teachers Rivers State ($x_2 = 2.08$, $SD = 0.91$). The independent samples t -test showed no significant difference in the mean proficiency scores [$t(325) = 1.23$, $p = .219$] and the influence [$t(325) = 1.25$, $p = 0.21 > 0.05$] of classroom-integration scores of digital learning resources between Physics teachers in Ogun State. Comparatively, Physics teachers in Ogun State demonstrated slightly higher proficiency and influence on effective classroom integration for designing and developing digital learning resources (DLRs) for Physics Teaching. The study recommended that organization of regular professional development programs to enhance Physics teachers' pedagogical and technical skills in designing subject-specific digital learning resources, Government and school administrators should ensure the provision of digital tools, software, and reliable internet to support Physics teachers in effectively designing and integrating digital learning resources among others.

Keywords: Digital, Digital learning Resource, Integration, Proficiency. Physics

Introduction

The study of Physics at the secondary school level is essential for building and fostering scientific literacy, which empowers learners to understand the natural world, analyze scientific phenomena, and make informed decisions in their everyday lives. Fundamental Physics concepts such as energy, motion and electricity serves as the foundation for everyday technologies and societal challenges, ranging from renewable energy solutions to communication systems. By mastering these fundamental Physics concepts, students cultivate the capacity to critically assess scientific information and utilize evidence-based reasoning, which is vital for responsible citizenship in a technology-oriented society (Aderonmu & Adolphus, 2023). Physics acts as a gateway to STEM careers, offering the essential baseline knowledge and skills necessary for engineering, medicine, information technology, and emerging domains such as artificial intelligence and space science. The study of Physics in secondary schools provides students with essential skills in problem-solving, analysis, and mathematical reasoning, which are crucial for achieving success in both higher education and various professional careers. Consequently, nations seeking to enhance their STEM workforce place a high priority on Physics education to maintain a consistent flow of talent necessary for national progress.

Physics plays a crucial role in the progress of technology and innovation. This discipline drives advancements in energy, transportation, healthcare, and communication by encouraging students to think creatively and participate in scientific exploration. By engaging with practical experiments, simulations, and digital educational tools, students acquire hands-on experience that nurtures curiosity and fosters innovation. Strengthening Physics education at the secondary level not only equips individuals for personal development and professional achievement but also fosters societal advancement by cultivating a generation adept at addressing intricate scientific and technological challenges (Nkweke, 2020).

Globally, there has been a significant focus on integrating Information and Communication Technologies (ICT) into education to enhance teaching,

learning, and student academic outcomes. Global organizations such as UNESCO and the OECD have repeatedly emphasized the importance of ICT in fostering inclusive, equitable, and high-quality education (Zhao-Ma, et al. 2024; UNESCO, 2023 & OECD, 2020). The Sustainable Development Goal 4 (SDG 4) further highlights the necessity of utilizing technology to improve access to education, encourage innovative teaching practices, and equip learners with digital competencies for the 21st century. As a result, numerous countries are reforming their educational frameworks by integrating digital literacy into their curricula, training educators in the use of technology, and investing in digital infrastructure to develop more engaging and interactive learning environments.

At the national level, nations such as Nigeria have acknowledged the essential role of integrating ICT in enhancing science and technology education. The Nigerian National Policy on Information and Communication Technology in Education highlights the importance of utilizing digital tools and resources to elevate the quality of instruction, especially in STEM disciplines like Physics. Programs such as the Nigerian Education Management Information System (NEMIS) and ICT-in-Education policies are established to offer both hardware and software resources, along with professional development opportunities for teachers (Nwobodo & Udoka, 2025; & FME, 2019). These initiatives aim not only to modernize teaching practices but also to close the digital gap and ensure that students develop the technological skills required for national progress and engagement in a global knowledge economy (Aderonmu and Oni, 2025).

Digital Learning Resources (DLRs) refer to technology-driven materials, tools, and platforms that are designed to facilitate teaching and learning activities (Serafin, 2025). These resources encompass any type of digital content that improves learning experiences by rendering them more interactive, accessible, and engaging. DLRs can be utilized in traditional classrooms, online educational settings, or hybrid learning environments. Digital Learning Resources (DLRs) are increasingly recognized as essential tools for enhancing the teaching and learning of Physics at the secondary school level. Physics often deals with abstract concepts such as motion, electricity, waves, and energy, which students may find difficult to grasp through traditional chalk-and-talk methods

DLRs such as simulations, interactive videos, virtual laboratories, and animations make Physics concepts more engaging and visually accessible. By providing dynamic illustrations and hands-on virtual experiments, DLRs help learners to visualize and manipulate abstract phenomena, thereby fostering deeper conceptual understanding and reducing misconceptions (Obafemi and Aderonmu, 2022). Effective integration of digital learning resources (DLRs) plays a crucial role in enhancing students' conceptual understanding of Physics. Many Physics concepts, such as electricity, waves, or atomic structures, are abstract and difficult for learners to visualize through traditional teaching methods alone. When Physics teachers skillfully incorporate DLRs like simulations, animations, and virtual laboratories, students are able to interact with representations of these concepts, observe cause-and-effect relationships, and test variables in real time. This not only deepens their comprehension but also reduces common misconceptions, making Physics more accessible and meaningful. By linking abstract theories to dynamic visualizations, digital resources transform passive learning into active exploration.

Beyond improving conceptual grasp, the integration of DLRs also fosters student engagement and problem-solving skills (Alazemi, 2022). Interactive platforms, such as physics-based games or inquiry-driven simulations, encourage learners to actively participate in the learning process rather than simply receive information. This engagement increases motivation and curiosity, while structured problem-solving tasks within digital environments help students' practice critical thinking and apply Physics principles to real-world situations. As a result, DLRs not only make Physics classes more interesting but also prepare students with transferable analytical skills essential for STEM-related careers. Therefore, effective integration of digital resources directly enhances the quality and outcomes of Physics learning. In addition to enhancing the understanding of Physics, DLRs connect classroom learning with real-world applications (Alazemi, 2022). For instance, digital tools can illustrate how mechanical principles are utilized in engineering, or how energy transformation concepts are linked to renewable technologies. This connection inspires students by demonstrating the practical relevance of Physics in addressing everyday challenges. Moreover, the implementation of DLRs fosters active learning, collaboration, and critical thinking, which are essential components of 21st-century education. Consequently, the effective incorporation of DLRs not only enriches Physics instruction but also equips

students for careers in STEM fields and engagement in a technology-oriented society.

Teachers' proficiency in designing and developing digital resources can be understood in terms of their knowledge, skills, and confidence. Knowledge involves an understanding of both subject content and digital pedagogical strategies necessary for creating effective learning resources. Skills refer to the practical ability to use digital tools, such as multimedia software, simulations, or learning management systems, to design interactive and subject-specific materials that enhance students' learning experiences. Confidence, on the other hand, reflects teachers' self-efficacy and willingness to experiment with technology, adapt resources to different contexts, and integrate them effectively into classroom instruction. When teachers possess strong knowledge, refined skills, and high confidence, they are better positioned to create engaging, curriculum-aligned digital resources that foster meaningful learning. Several authors have separately highlighted that proficiency is understood as a multidimensional construct encompassing four interrelated components of DLRs that are essential for effective classroom integration, vis;

1. Knowledge of Digital Resource Design – Teachers' understanding of subject content, pedagogy, and instructional design principles needed for creating effective Physics DLRs (Agyei et al., 2024).
2. Technical Skills in Resource Development – The practical ability to use digital tools (software, simulations, multimedia applications) to produce Physics specific instructional resources (Kola & Azeez, 2023).
3. Applications and Creativity in Design – The capacity to adapt, contextualize, and innovate with digital resources to align with learners' needs and real world Physics applications (Sobrino Morrás et al., 2025).
4. Confidence and Proficiency – Teachers' self-efficacy and comfort in independently creating, sharing, and refining Physics DLRs for instructional purposes (Adebanjo & Orifah, 2023).

The proficiency of teachers is crucial for the effective utilization of digital learning resources, as mere availability does not ensure their influence on student learning. Numerous schools may possess computers, projectors, and internet connectivity; however, in the absence of skilled teachers who are capable of designing and adapting digital resources, such tools frequently go underused. Proficiency enables teachers to align digital content with

curriculum goals, choose suitable tools for particular topics in Physics, and tailor resources to meet the learning requirements of their students. Therefore, teacher competence serves as a vital link between access to ICT and its significant application in the classroom.

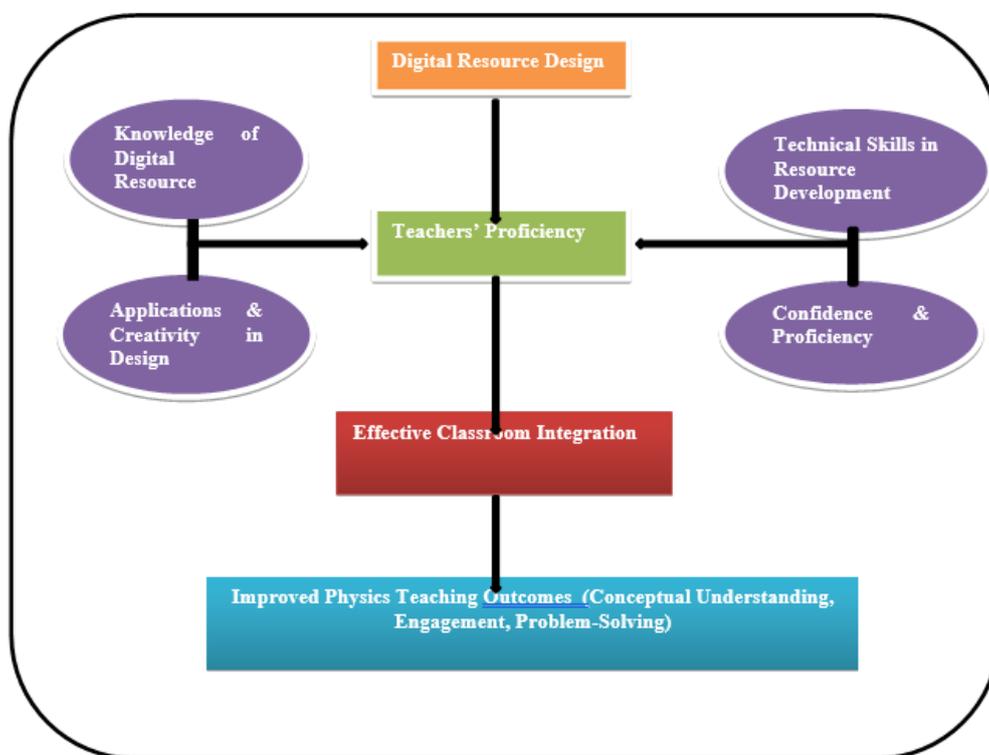


Figure 1: Components of Digital Learning Resources (DLRs)

The study of Physics at the secondary school level is mostly perceived as a subject embodied with abstract concepts, therefore, teacher proficiency is particularly important in creating digital resources that simplify complexity. For example, animations and simulations can make invisible phenomena like concepts wave motion, atomic structures or quantization of energy more concrete and easily understood by the student, but only a skilled teacher can adapt these resources to emphasize key learning outcomes. Without adequate proficiency, digital tools may be misused as mere presentation aids rather than interactive platforms that promote inquiry, experimentation, and problem solving. Therefore, teacher expertise ensures that digital resources are not only technically correct but also pedagogically effective (Aderonmu & Agbesor, 2025). Proficiency boosts teacher confidence and innovation in integrating technology into Physics instruction. Teachers equipped with the knowledge and skills to design and adapt digital learning resources are more inclined to

explore interactive methods, stimulate student involvement, and facilitate collaborative learning. This assurance enables them to move beyond traditional, teacher-focused techniques and adopt dynamic, student-oriented strategies that nurture critical thinking. Consequently, teacher expertise encompasses not only technical skills but also the ability to transform digital resources into significant learning experiences that improve outcomes in the study of Physics.

Several recent studies have shown that while many Physics teachers are aware of the potential of ICT tools, their ability to effectively design and create specific Physics content using digital learning resources remains limited. For instance, Hamoud and Nzilano (2024) found that secondary school science teachers in Tanzania demonstrated high awareness of ICT resources but lacked the technical and pedagogical skills to design customized digital learning materials for classroom use. Similarly, Jack and Ayuba (2022) revealed that although Physics teachers in Nigerian secondary schools reported positive perceptions of ICT integration, their use of digital resources was restricted to basic functions such as PowerPoint presentations, with limited efforts to create or adapt interactive digital simulations and models.

Numerous studies indicate that although many Physics teachers recognize the potential of ICT tools, their capacity to effectively design and develop specific Physics content utilizing digital learning resources is still constrained. Hamoud and Nzilano (2024) discovered that secondary school science teachers in Tanzania exhibited a strong awareness of ICT resources but lacked the necessary technical and pedagogical skills to create customized digital learning materials for classroom application. In a similar vein, Jack and Ayuba (2022) found that while Physics teachers in Nigerian secondary schools expressed favorable views on ICT integration, their engagement with digital resources was limited to basic functionalities such as PowerPoint presentations, with minimal attempts to create or modify interactive digital simulations and models.

These findings highlight a disparity between awareness and actual design capabilities. The literature indicates that this gap is primarily attributed to insufficient professional development and a lack of practical training in digital resource design. According to Gür et al. (2024), pre-service teachers typically receive a general introduction to ICT tools but do not have structured opportunities to practice developing Physics digital content, such as

simulations or virtual laboratory activities. This deficiency undermines their confidence and creativity in utilizing technology within real classroom settings. As a result, even with increasing investments in ICT infrastructure, the lack of robust design skills among Physics teachers diminishes the educational value of digital resources, thereby restricting their ability to enhance teaching and learning in secondary education.

Statement of Problem

Despite the increasing investment in Information and Communication Technology (ICT) within the educational sector, a notable gap persists between the availability of digital tools in schools and their practical application in Physics classrooms. In order to attain global competitiveness, secondary schools across Nigeria, particularly in Ogun and Rivers State, are becoming better equipped with ICT resources such as computers, projectors, internet connectivity, and educational software. Nevertheless, research has repeatedly demonstrated that Physics teachers tend to underutilize these resources, frequently limiting their use to fundamental tasks such as preparing lesson notes or presenting PowerPoint slides. This limited application curtails the potential of ICT to revolutionize Physics instruction into an interactive, inquiry-driven process that fosters deeper conceptual understanding, enhances student engagement, and cultivates problem-solving abilities. The current emphasis on ICT integration tends to prioritize access and basic usage over teachers' expertise in crafting and developing subject specific digital learning resources. Although there is a growing awareness and utilization of digital tools among Physics teachers, evidence suggests that many lack the necessary knowledge, skills, and confidence to produce tailored digital content, such as simulations, animations, or virtual laboratory experiences that align with curriculum goals. In the absence of sufficient proficiency in the design of digital learning resources, the mere presence of ICT tools does not lead to effective classroom integration or improved student performance. This disparity underscores the pressing need to evaluate the actual proficiency of Physics teachers in designing and developing digital learning resources for successful integration into Physics education in secondary schools located in both Ogun and Rivers State.

Aim and Objectives of the Study

The aim of the study is to Assess Physics Teachers' Proficiency in Designing and Developing Digital Learning Resources for Effective Classroom Integration. Specifically, the objectives of the study are to;

1. investigate the proficiency level of Physics teachers in designing and developing digital learning resources for classroom instruction.
2. examine how Physics teachers' proficiency in digital resource design influences the effective integration of these resources into classroom teaching.

Research Questions

The following research questions were raised for the study.

1. What is the proficiency level of Physics teachers in designing and developing digital learning resources for classroom instruction?
2. How does Physics teachers' proficiency in digital resource design influence the effective integration of these resources into classroom teaching?

Hypotheses

The following hypotheses were tested at 0.05 level of significance.

H₀₁: There is no significant difference in the mean proficiency scores for designing and developing digital learning resources between Physics teachers in Ogun State and those in Rivers State.

H₀₂: There is no significant difference in the mean on the influence of classroom-integration scores of digital learning resources between Physics teachers in Ogun State and those in Rivers State.

Methodology

The cross-sectional descriptive research design was adopted for the study. Wang and Cheng (2020) asserted that cross-sectional studies are observational studies that examine data from a population at a specific point in time. These studies are frequently employed to assess the prevalence of outcomes within the population, identify determinants affecting the population, and characterize various features of that population. The study was carried out in Ogun State and Rivers State in Nigeria. These states are ranked among the top ten digital

literacy and tech savy states in Nigeria (Williams, 2024). Ogun state is one of the states located in the South-West of Nigeria with approximate central coordinates of (Latitude: 7.0000° N and Longitude: 3.5833° E) with borders of Oyo State in the North, Lagos State and Atlantic Ocean in the south, Ondo State in the east and Republic of Benin in the West (Which is an International border). The state has a wide spread of both public and private secondary schools with literacy rates are above the national average, reflecting a strong emphasis on education. On the other hand, Rivers State is located in the South-South geographical location (Within the Niger-Delta) of Nigeria an approximate central coordinates of (Latitude: 4.7500° N Longitude: 6.8333° E). Rivers State has invested significantly in expanding access to secondary education with several school spread both in the upland and riverine areas of the state. The state is bordered by Imo State and Abia State to the North, Akwa Ibom State to the Eastg, Bayelsa State to the West and The Atlantic Ocean (coastal boundary) to the South.

The population of the study consisted of all secondary school Physics teachers in both Ogun and Rivers State, Nigeria. Using a stratified sampling technique, 327 Physics teachers were selected from public and private schools for both states.

Table 1: Sampling Table for Ogun and Rivers State Physics Teachers

State	Frequency	Percentage
Ogun	149	45.5%
Rivers	178	54.5%

Source: Researchers' fieldwork, 2025

The distribution of Physics teachers across the two states shows that out of the total sample of 327 teachers, 149 (45.5%) are from Ogun State, while 178 (54.5%) are from Rivers State. This indicates that Rivers State has a slightly higher representation of Physics teachers in the sample compared to Ogun State.

The instrument for data collection was the researchers' designed questionnaire titled "Physics Teachers' Proficiency in Designing and Developing Digital Learning Resources" (PTP-3DLRs). The instrument comprised of three sections; A, B and C. Section was designed to obtained demographic data of type of school, State of present teaching school, and gender. Section B consisted of 20 item statements that were further categorized into 4 sub-sections of Knowledge of Digital Resource Design, Technical Skills in

Resource Development, Application and Creativity in Design and Confidence and Proficiency. This section was designed to elicit information from the participants of the study on the proficiency level of Physics teachers in designing and developing digital learning resources for classroom instruction. The measuring scale adopted was the 5 point modified Likert scale of Never = 1 point, Beginner = 2 points, Developing = 3 points, Proficient = 4 points and Advanced = 5 points. The aggregate mean value for decision making further categorized as shown in Table 1 below.

Table 2: Aggregate Mean value and of categorization of Physics teachers level of proficiency

Aggregate Mean value	Categorization (Proficiency level)
0.00 – 1.60	Beginner
1.61 – 3.30	Developing
3.31 – 5.00	Advanced

Section C was developed to elicit information on how Physics teachers’ proficiency in digital resource design influences the effective integration of these resources into classroom teaching. 15 item statements were designed using the four-point Likert scale of Strongly Agreed = 4 point, agreed = 3 points, disagree = 2 points and Strongly Disagree = 1 point. Questionnaire on Physics Teachers’ Proficiency in Designing and Developing Digital Learning Resources was validated by experts in Physics Education, Educational technology and Measurement and Evaluation in ensuring that the instrument measures what it is intended to measure. The instrument was further subjected to a pilot study on 40 teachers [20 in each state] to ascertain the reliability of the instrument. The test-retest method was used to obtain the data and was further analyzed using the Cronbach Alfa reliability statistics. A coefficient value of $r = 0.86$ was obtained making the instrument 86% reliable for the study. The data for the study was analyzed using the descriptive statistics of frequency count, mean, standard deviation while the inferential statistics of t-test was employed for the hypotheses.

Results

Research Question 1: What is the proficiency level of Physics teachers in designing and developing digital learning resources for classroom instruction?

Table 3: Showing Physics teachers’ response proficiency level of Physics teachers in designing and developing digital learning resources for classroom instruction

S/N	Item Statements	Mean (x1)	SD	Mean (x2)	SD
	Knowledge of Digital Resource Design				

1	I can identify Physics concepts best taught with DLRs.	2.12	0.82	2.15	0.91
2	I understand the principles of designing interactive Physics simulations.	1.52	0.93	1.21	0.97
3	I can align digital resource design with the Physics curriculum and learning objectives.	2.61	0.87	2.43	0.91
4	I know how to incorporate assessment tools into Physics digital resources.	1.58	0.95	1.33	0.80
Technical Skills in Resource Development					
5	I can use presentation software to design Physics learning materials.	3.21	0.73	2.98	0.81
6	I can develop digital concept maps and diagrams to represent Physics ideas.	2.27	1.02	2.19	0.99
7	I can create Physics instructional videos or screencasts for classroom use.	2.71	0.84	2.55	0.93
8	I can design Physics quizzes and tests using digital platforms	2.02	1.10	2.11	1.05
9	I can use subject-specific software (e.g., PhET simulations) to design learning activities.	1.89	0.76	1.77	0.94
Application and Creativity in Design					
10	I can integrate animations and graphics into Physics learning resources.	1.65	0.90	1.52	0.99
11	I can adapt existing digital learning resources to suit the needs of my students.	1.99	1.04	2.10	0.97
12	I can create real-life Physics problem-solving activities using digital platforms.	2.06	0.82	2.02	0.81
13	I can design interactive Physics laboratory experiments in a digital format.	1.48	0.93	1.61	0.99
14	I can combine multiple media (text, audio, video, graphics) to create Physics resources.	2.32	0.96	2.14	1.01
15	I can develop Physics learning resources that encourage student-centered inquiry.	2.71	0.77	2.82	0.84
Integration and Teaching Effectiveness					
16	I feel confident in designing Physics resources that enhance students' conceptual understanding.	2.55	0.92	2.63	0.98
17	I am able to troubleshoot challenges when creating digital Physics resources.	1.98	1.11	1.76	0.85
18	I am comfortable sharing self-designed Physics resources with colleagues or students.	2.81	0.81	2.75	0.95
19	I can independently design Physics digital resources without external assistance.	2.05	0.87	2.09	0.91
20	I am able to improve the quality of my designed Physics digital learning resources.	1.90	0.92	1.82	0.97
Aggregate mean value		2.17	0.90	2.09	0.92

Source: Researchers' fieldwork, 2025. [x_1 = PTOGS], [x_2 = PTRVS]

The Table 3 indicated that the aggregate mean values showed that Physics teachers in Ogun State ($x_1 = 2.17$, $SD = 0.90$) and Rivers State ($x_2 = 2.09$, $SD = 0.92$) both fall within the “Developing” proficiency category (1.61 – 3.30). This indicates that, while teachers in both states possess some degree of knowledge and skills in designing and developing digital learning resources (DLRs), their influence on effective classroom integration is not yet at an advanced level. Comparatively, Physics teachers in Ogun State demonstrated slightly higher proficiency (mean = 2.17) than their counterparts in Rivers State (mean = 2.09). However, the difference is marginal, and both states remain within the same category of proficiency.

Research Question 2: How does Physics teachers’ proficiency in digital learning resource design influence the effective integration of these resources into classroom teaching?

Table 4: Showing Physics teachers’ proficiency in digital learning resource design influence the effective integration of these resources into classroom teaching

s/n	Item Statement	Mean (x ₁)	Stdv	Mean (x ₂)	Stdv
1	My proficiency in digital resource design helps me teach Physics concepts more effectively.	1.81	0.91	1.18	0.89
2	Students show improved conceptual understanding when I use self-designed digital resources.	2.01	0.84	1.87	0.88
3	My digital resources increase students’ participation and interest in Physics lessons.	1.96	0.93	2.00	0.95
4	The use of my digital resources improves students’ problem-solving and critical thinking skills.	2.78	0.87	2.82	0.94
5	My confidence in designing digital resources contributes to effective classroom integration.	2.03	0.91	1.95	0.92
6	I can effectively integrate self-designed digital resources into different stages of Physics lessons.	1.84	0.88	1.99	0.91
7	The use of digital resources makes abstract Physics concepts more concrete and understandable.	2.85	0.95	2.57	0.93
8	Digital resources I design help to bridge the gap between theory and practical applications in Physics.	2.08	0.90	1.94	0.87
9	I am confident that my digital resources contribute to better student achievement in Physics.	2.24	0.89	2.19	0.91
10	The digital resources I design support students in independent learning outside the classroom.	2.12	0.87	2.01	0.85
11	I use my digital resources to differentiate instruction and cater to diverse learning styles in Physics.	2.27	0.92	2.11	0.94
12	Integrating my digital resources into teaching enhances classroom interaction and discussion.	2.38	0.88	2.25	0.91
13	My digital resource integration allows me to cover Physics curriculum content more effectively.	2.32	0.93	2.19	0.95
14	I regularly evaluate the effectiveness of my digital resources based on student feedback and	2.10	0.91	1.98	0.89

15	performance. The integration of my digital resources into Physics teaching has reduced my reliance on traditional teaching methods.	2.22	0.87	2.09	0.92
Aggregate mean value		2.20	0.90	2.08	0.91

Source: Researchers' fieldwork, 2025. [x_1 = PTOGS], [x_2 = PTRVS]

The analysis on Table 4 showed the aggregate mean scores for Physics teachers in Ogun State ($x_1 = 2.20$, $SD = 0.90$) and Physics teachers Rivers State ($x_2 = 2.08$, $SD = 0.91$). This indicates that, while teachers in both states possess some degree of knowledge and skills in designing and developing digital learning resources (DLRs), their influence on effective classroom integration is not yet at an advanced level, but they demonstrate foundational competencies that can be built upon.

Hypotheses

H₀₁: There is no significant difference in the mean proficiency scores for designing and developing digital learning resources between Physics teachers in Ogun State and those in Rivers State.

Table 5: Independent sample t-test analysis of Physics teachers on proficiency scores for designing and developing digital learning resources

Group	N	Mean	Std. Dev.	df	T	p-value	Decision
PTOGS	149	2.17	0.90				
PTRVS	178	2.09	0.92	325	1.23	0.219	Not Sig.

Source: Researchers' fieldwork, 2025.

The independent samples t-test showed no significant difference in the mean proficiency scores for designing and developing digital learning resources between Physics teachers in Ogun State ($M = 2.17$, $SD = 0.90$) and those in Rivers State ($M = 2.09$, $SD = 0.92$), $t(325) = 1.23$, $p = .219$. Therefore, the null hypothesis (H_{01}) is retained, meaning that both groups of teachers have comparable proficiency levels.

H₀₂: There is no significant difference in the mean on the influence of classroom-integration scores of digital learning resources between Physics teachers in Ogun State and those in Rivers State.

Table 6: Independent sample t-test analysis of Physics teachers on the influence of classroom-integration scores of digital learning resources between Physics teachers in Ogun State.

Group	N	Mean	SD	df	T	p-value	Decision
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Group	N	Mean	SD	df	T	p-value	Decision
PTOGS	149	2.20	0.90				
PTRVS	178	2.08	0.91	325	1.25	0.21	Not Sig.

Source: Researchers' fieldwork, 2025.

The independent samples t-test shows no significant difference in the mean on the influence of classroom-integration scores of digital learning resources between Physics teachers in Ogun State ($M = 2.20$, $SD = 0.90$) and Rivers State ($M = 2.08$, $SD = 0.91$), $t(325) = 1.25$, $p = 0.21 > 0.05$. This indicates that both groups of teachers demonstrate a similar level of influence of classroom integration of digital learning resources. Therefore, the null hypothesis (H_0) is retained.

Discussion

The findings of this study revealed that Physics teachers in both Ogun State ($M = 2.17$, $SD = 0.90$) and Rivers State ($M = 2.09$, $SD = 0.92$) demonstrated a “Developing” proficiency level in designing and developing digital learning resources (DLRs). This suggests that while teachers possess foundational knowledge and skills in the use of digital tools, their competence remains below the advanced level required for transformative teaching and learning practices. The results are consistent with earlier studies which highlighted that many Nigerian teachers, although aware of digital technologies, still face challenges in effectively designing resources that align with curriculum needs (Dogo et al., 2021). A closer comparison indicates that teachers in Ogun State showed slightly higher proficiency than their counterparts in Rivers State. Although the difference is marginal, it may reflect subtle variations in exposure to digital tools, training opportunities, or policy implementation in the two states. White and Downey (2025) emphasized that access to appropriate hardware and software significantly influences teachers' ability to create meaningful digital resources, which may explain why proficiency levels vary across different contexts. This aligns with the current finding that both groups of teachers are still developing, implying systemic gaps in professional development.

The “Developing” category of proficiency highlights that teachers are not entirely novice but are still building competence. This reflects the transitional phase of digital integration in Nigeria's education sector, where teachers recognize the potential of digital resources but often lack the advanced skills to design high-quality, interactive, and student-centered tools (Okonkwo,

2022). The implication is that without structured capacity-building programs, teachers may remain limited in leveraging digital resources for effective instruction, especially in complex subjects like Physics that require visualization and simulation. Another possible explanation for the developing proficiency is the lack of continuous professional training and inadequate institutional support. Studies have shown that even when teachers are familiar with digital technologies, effective integration depends on regular training and supportive learning environments (Afolabi & Oyeniran, 2020). In this case, the findings suggest that while Physics teachers are experimenting with digital resource design, their progress may be hindered by insufficient mentorship, limited access to subject-specific software, and weak infrastructural support in schools. The findings emphasize the urgent need for targeted training programs, policy interventions, and resource provision to help teachers transition from a developing to an advanced proficiency level. As highlighted by Olibie and Eze (2021), professional development tailored to subject-specific needs enhances teachers' capacity to integrate ICT into pedagogy more effectively. Thus, improving teachers' proficiency in digital resource design is not only necessary for better Physics instruction but also crucial for advancing Nigeria's broader educational goals in the digital era. Also by adopting a holistic approach, teachers across states can be better equipped to integrate digital resources effectively into Physics classrooms, thereby improving instructional quality and student learning outcomes. The result of the independent samples t-test revealed that there was no significant difference in the mean proficiency scores for designing and developing digital learning resources between Physics teachers in Ogun State ($M = 2.17$, $SD = 0.90$) and those in Rivers State ($M = 2.09$, $SD = 0.92$), $t(325) = 1.23$, $p = .219$. This finding suggests that both groups of teachers share similar levels of proficiency in digital learning resource (DLR) design, indicating that state location may not be a strong determinant of teachers' competence in this area.

The findings of the study also indicated that aggregate mean scores revealed that Physics teachers in Ogun State ($M = 2.20$, $SD = 0.90$) and Rivers State ($M = 2.08$, $SD = 0.91$) demonstrated moderate levels of proficiency in designing and integrating digital learning resources (DLRs) into classroom teaching. This finding suggests that teachers in both states are at a developing stage, showing some degree of competence but not yet reaching advanced proficiency. Such results align with previous studies that observed teachers in Nigeria and other developing contexts often possess basic ICT literacy but

lack the advanced skills required for effective integration into subject teaching (Okonkwo, 2022; Yusuf & Alabi, 2021).

The findings also highlight that teachers' proficiency directly influences the quality of integration of DLRs in Physics classrooms. With moderate proficiency, teachers may succeed in designing simple presentations, quizzes, or simulations but struggle with advanced creative tasks such as interactive laboratory experiments or adaptive learning systems. This limited capacity means that while DLRs are used, their transformative impact on teaching and learning outcomes may not be fully realized. As Afolabi and Oyeniran (2020) argue, ICT integration is most effective when teachers move beyond basic tool usage to innovative pedagogical applications. Moreover, the results show only a marginal difference between Ogun ($M = 2.20$) and Rivers ($M = 2.08$), implying that geographic location is not a strong predictor of proficiency levels. Instead, the finding underscores a systemic challenge across Nigerian secondary schools where teachers receive limited training and support for digital pedagogies (Olibie & Eze, 2021). Another important implication of this finding is the relationship between teacher confidence and classroom effectiveness. Teachers with moderate proficiency may experience hesitation or lack the confidence to fully integrate DLRs into lessons, which can limit classroom engagement and innovation. Research by Amusa (2024) supports this, showing that even when digital tools are available, teachers often underutilize them due to limited proficiency and confidence. Thus, addressing teacher preparedness is essential if digital learning is to positively impact Physics education. The results also emphasize the need for targeted professional development to move teachers from developing to advanced proficiency. Training workshops, peer collaboration, and institutional support structures are necessary to improve both the technical skills and pedagogical applications of DLRs in Physics. As noted by Oladejo and Oyeniran (2023), equipping teachers with advanced ICT competencies can foster deeper conceptual understanding among students, improve problem-solving abilities, and enhance overall classroom interaction. Therefore, investing in teacher capacity building remains critical to maximizing the potential of digital learning resources in Physics education. The findings of the independent samples t-test revealed no significant difference in the mean classroom-integration scores of digital learning resources between Physics teachers in Ogun State ($M = 2.20$, $SD = 0.90$) and Rivers State ($M = 2.08$, $SD = 0.91$), $t(325) = 1.25$, $p = 0.21 > 0.05$. This result indicates that both groups of teachers demonstrate similar levels of proficiency when it comes to integrating

digital resources into classroom instruction. The lack of significant difference suggests that the challenges and opportunities associated with digital resource integration are systemic rather than state-specific, reflecting broader patterns in teacher preparedness and ICT adoption across Nigerian secondary schools.

Conclusion

The comparative assessment of Physics teachers' proficiency in designing and developing Digital Learning Resources (DLRs) for effective classroom integration revealed that teachers in Ogun and Rivers States remain at a "developing" level of proficiency with overall mean scores reflecting moderate competence in areas such as knowledge, technical skills, creativity, and confidence. While this indicates that they possess some knowledge and skills in digital resource design, they have not yet attained the advanced level required for innovative and impactful classroom practices. The study highlights that although digital tools are increasingly present in schools, teachers' capacity to effectively design, adapt, and utilize them in Physics instruction is still evolving. The absence of a statistically significant difference between the two states suggests that the challenges facing teachers are systemic rather than state-specific. These points to broader issues such as inadequate training opportunities, limited access to subject-specific digital tools, and a lack of ongoing professional support. Even though Ogun State teachers showed slightly higher mean scores compared to their counterparts in Rivers State, both groups require structured interventions to strengthen their digital pedagogical practices. Improving Physics teachers' proficiency in digital resource design is critical for advancing science education and preparing students for the demands of the 21st century.

Recommendation

The following recommendations were stipulated for the study;

1. Regular and targeted professional development programs should be organized to strengthen Physics teachers' knowledge, technical skills, creativity, and confidence in digital resource design. These training programs should emphasize both the pedagogical and technical aspects of developing subject-specific DLRs.
2. Educational stakeholders, including government agencies and school administrators, should ensure equitable access to digital tools, software, and reliable internet connectivity in both public and private

schools. This will provide Physics teachers with the necessary resources to effectively design, develop, and integrate DLRs into classroom instruction.

3. Platforms for peer collaboration and mentorship should be established, allowing teachers to share experiences, co-develop digital resources, and evaluate their effectiveness. Such initiatives will foster innovation, enhance teachers' confidence, and promote the effective classroom integration of DLRs across both Ogun and Rivers States.

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Effects of Compassion-Focused Therapy and Dialectical Behaviour Therapy on Aggression among Adolescents with Substance-Abusing Parents in Lagos State, Nigeria

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Abstract

Parental substance abuse can severely compromise a child's access to essential physical, emotional, social, and mental support, leaving them susceptible to adverse experiences and potential psychosocial challenges like aggression, anxiety, low self-esteem, and shame, among other emotions and behaviours. Addressing these issues is crucial for the child's overall well-being and development. This study examined the effectiveness of Compassion-Focused Therapy (CFT) and Dialectical Behaviour Therapy (DBT) on aggression among adolescents with substance-abusing parents. The study was anchored on Attachment and Family Systems Theories. Two objectives and two research questions were raised, and two corresponding hypotheses were tested at a 0.05 level of significance. Using a quasi-experimental pretest-posttest control design, the study sampled 101 adolescents (39 males, 62 females) from three Education Districts in Lagos State based on their response to the Children with Substance-Abusing Parents Identification Questionnaire (CSPIQ). The data collection instrument used for this study was the Aggression Questionnaire for Adolescents (AQA) with a reliability index of 0.70. All hypotheses were tested at a 0.05 level of significance. The results showed a significant reduction in aggression levels among participants exposed to both CFT and DBT. The findings also revealed that CFT showed a more significant reduction in aggression levels than DBT. The study recommends utilising both therapies to manage adolescents with poor psychosocial adjustment. This research highlighted the potential of Compassion-Focused and Dialectical Behaviour therapies in addressing the aggressive behaviours faced by adolescents with substance-abusing parents. The findings offer important implications for counsellors in Lagos State and comparable settings. Based on the results, it is recommended that DBT and CFT be utilised in managing and reducing aggressive behaviours among adolescents affected by parental substance abuse.

Keywords: Adolescents, Aggression, Compassion-focused therapy, Dialectical behaviour therapy, Substance-abusing parents

Introduction

The family is expected to be the cornerstone of a person's emotional and social development, offering a nurturing environment that fosters attachment, love, and growth. It should provide a foundation for a child. In a typical family setting, children are valued, respected, and esteemed. However, when parents abuse substances, these expectations are often unmet, creating a potentially hazardous environment for their children (Berg, Kuja-Halkola, D'Onofrio, Lichtenstein & Latvala, 2021). When parents struggle with substance abuse, it can compromise their capacity to provide for their children's overall well-being, leaving them vulnerable to adverse experiences that affect their emotional and social development. As a result, these children may grapple with a range of difficult emotions, including anxiety, aggression, fear, sadness, self-blame, shame, isolation, uncertainty, and frustration. The negative effects of parental substance use disorders on families include disrupted attachment, rituals, roles, routines, communication, social life, and finances. Effective parenting requires a stable mental state, free from substance abuse, to minimise the risk of poor developmental, psychological, and social outcomes. Children raised in substance-abusing homes are at a higher risk of experiencing psychosocial and emotional distress, such as aggression, shame, anxiety, and low self-esteem, due to stress (Lander, Howsare & Byrne, 2013). Children living with addicted parents often engage in risky behaviours, including aggression, vandalism, and truancy (Douglas-Siegel & Ryan, 2013), and parental substance abuse can have long-lasting and disastrous impacts on children's health and well-being (Kuppens, Moore, Gross, Lowthian & Siddaway, 2020).

In Nigeria, drug abuse is a growing public health concern, with an estimated 14.3 million people using drugs, accounting for approximately 14.4% of the population aged 15-64 (United Nations Office on Drugs and Crime [UNDOC], 2018). This nearly triples the global prevalence of drug use, estimated at 5.6% (UNODC, 2015). According to UNODC (2018), data from the National Survey on Drug Use and Health, revealed that the south-west zone had the highest prevalence (22.4%), with Lagos State being significantly affected, while the highest levels of any past-year drug use were found among adults and older people, but adolescents are also vulnerable, especially when their parents or guardians abuse substances. Adolescence is defined by the World Health Organization (2017) as the stage between childhood and adulthood

(ages 10-19). It is a critical period of rapid physical, cognitive, and psychosocial growth. During this stage, adolescents face numerous challenges, and parental substance abuse can exacerbate these difficulties. The uncertainty and ambiguity of adolescence can lead to conflicts, and substance abuse by parents can make this period even more challenging to navigate. Research evidence shows that children of parents with substance abuse issues are more likely to exhibit aggressive behaviour, engage in risky behaviours, and develop conduct disorders (Babicka-Wirkus, Kozłowski, Wirkus & Stasiak, 2023).

Given the prevalence of substance abuse in Nigeria, particularly in Lagos State, it's crucial to examine the ripple effects on adolescents who are already navigating the challenges of this critical developmental stage, as well as how it affects both male and female adolescents with substance-abusing parents. According to Babicka-Wirkus et al. (2023), the relationship between gender and parental substance abuse is complex, with boys and girls being affected differently. They posit that boys are more likely to exhibit externalising behaviours, such as aggression and delinquency, while girls are more likely to exhibit internalising behaviours, such as anxiety and depression. The impact of parental substance abuse varies depending on several factors, including age, developmental stage, type and severity of substance abuse, family dynamics, and individual child characteristics. Parental substance abuse can have devastating effects on children's well-being, making targeted interventions crucial. This study explored the effectiveness of two therapeutic approaches: Compassion-Focused Therapy (CFT) and Dialectical Behaviour Therapy (DBT), in addressing psychosocial challenges such as aggression, anxiety, self-esteem, and shame among children of substance abusers. CFT fosters emotional healing through compassion and self-compassion, while DBT combines cognitive-behavioural techniques with mindfulness and acceptance-based strategies to manage emotions and behaviours. By utilising CFT and DBT, this study aimed to promote resilience and recovery among these vulnerable children.

Statement of the Problem

Parental substance abuse is a widespread issue that significantly destabilises family relationships, negatively affecting children's emotional, psychological, and developmental health. Despite awareness of the harmful consequences, the misuse of substances such as alcohol, tobacco, marijuana, heroin, cocaine,

and methamphetamine remains alarmingly common among parents and caregivers. This behaviour often leads to unpredictable and chaotic lifestyles, compromising parents' ability to provide for their children's physical, emotional, and safety needs. As a result, children may experience neglect, trauma, and difficulties in forming healthy relationships due to harsh and unstable home environments. Growing up in such conditions can impede children's development of essential life skills, such as communication, problem-solving, and conflict resolution, ultimately impacting their psychosocial well-being. Effective parenting requires a clear and stable mindset, free from substance abuse, to minimise the risk of adverse developmental, psychological, and social outcomes.

Children of substance abusers often face numerous psychosocial challenges, including aggression, anxiety, depression, shame, low self-esteem, and stress, which can have long-lasting consequences on their emotional, social, and cognitive development. Exposure to their parents' substance-induced behaviours, such as domestic violence, harsh discipline, or abandonment, can further exacerbate these challenges. Additionally, the stigma associated with having substance-abusing parents can profoundly affect these children, intensifying feelings of shame, guilt, isolation, and anxiety, making it even more challenging for them to cope. Moreover, children who grow up witnessing parental substance abuse are more likely to initiate early substance use themselves. Early substance use can disrupt brain development, impair academic and social functioning, and increase the risk of addiction and dependency later in life.

Despite the growing need for effective interventions for children of substance abusers, there are few studies available to tackle the psychosocial issues affecting adolescents with substance-abusing parents in Nigeria. Most studies, however, have been conducted abroad and cannot be generalised locally. Recognising this significant gap highlights the need for relevant studies to assess and manage psychosocial challenges and prevent maladjustment among adolescents with substance-abusing parents in Lagos State, Nigeria. This study investigated the effectiveness of Compassion-Focused Therapy (CFT) and Dialectical Behaviour Therapy (DBT) in enhancing psychosocial adjustment, mitigating the negative effects of parental substance abuse, and promoting the overall well-being of adolescents with substance-abusing parents in Lagos State, Nigeria.

Objectives of the Study

The purpose of this study was to examine the effects of compassion-focused therapy and dialectical behaviour therapy on aggression among adolescents with substance-abusing parents in Lagos State, Nigeria. Specifically, this study was designed to meet the following objectives:

1. Examine the difference in the post-test mean scores on the levels of aggression among adolescents who perceive their parents as substance abusers exposed to compassion-focused therapy, dialectical behaviour therapy, and the control group.
2. Examine the gender difference in the post-test mean score on the levels of aggression among adolescents with substance-abusing parents exposed to compassion-focused therapy, dialectical behaviour therapy, and the control group.

Research Questions

In line with the stated objectives of this study, the following research questions were raised and answered during the study:

1. 1. What is the difference in the post-test mean scores on the level of aggression among adolescents with substance-abusing parents in the three experimental conditions (Compassion-Focused Therapy, Dialectical Behaviour Therapy, and the Control Group)?
2. 2. To what extent is there a gender difference in the post-test mean scores on the level of aggression among adolescents with substance-abusing parents across the treatment and control groups?

Research Hypotheses

Based on the research questions, the following hypotheses were formulated and tested at a 0.05 level of significance.

1. There is no significant difference in the post-test mean scores on the level of aggression among adolescents with substance-abusing parents in the three experimental conditions (Compassion-Focused Therapy, Dialectical Behaviour Therapy, and the Control Group).
2. There is no significant difference in the post-test mean scores on the level of aggression among adolescents with substance-abusing parents

in the three experimental conditions (Compassion-Focused Therapy, Dialectical Behaviour Therapy, and the Control Group).

Methodology

This study employed a quasi-experimental, pre-test, post-test control group design. The study consisted of three experimental groups: two treatment groups and one control group. One group received Compassion-Focused Therapy (CFT), while the second group received Dialectical Behaviour Therapy (DBT). The third group served as the control group and did not receive any treatment during the study. Pre-tests and post-tests were administered to all three groups.

The design is presented as follows:

First experimental group **R** **O₁** **X₁** **O₂** = (Compassion-focused Therapy)

Second experimental group **R** **O₃** **X₂** **O₄** = (Dialectical Behaviour Therapy)

Third experimental group **R** **O₅** **C** **O₆**

R- Stands for randomization

O₁ O₃ O₅ are pre-test scores

O₂ O₄ O₆ are post-test scores

X₁ = represents treatment 1- Compassion-focused Therapy

X₂ = represents treatment 2- Dialectical Behaviour Therapy

C = represents the control group

Independent Variables: Compassion-focused Therapy and Dialectical Behaviour Therapy

Dependent Variables: Aggression

Moderating Variable: The moderating variable is gender (male and female).

Sample and Sampling Technique

The study employed a multi-stage sampling process to select participants. A total of 101 adolescents comprising of 39 males and 62 females were used for the study. The study covered six Education Districts in Lagos State. In the first stage, a simple sampling was used to select three out of the six Educational Districts in Lagos State, namely Educational District 1 (Agege), Educational District 2 (Maryland) and Educational District VI (Oshodi) with a total number of 124 schools and a combined population of 44,591 Senior Secondary Two (SS2) students, of which 21,595 were males and 22,997 were females.

In the second stage, a simple random sampling (Rand Between) was used to select one school from each of the three Districts. School A had a population of 361 SS2 students (174 males and 187 females), School B had a total population of 262 students (110 males and 152 females) while School C had a total population of 221 SS2 students (97 males and 124 females), totalling 844 SS2 students (381 males and 463 females) from the three schools.

In the third stage, a Baseline Questionnaire, the "Children with Substance-Abusing Parents Identification Questionnaire" (CSPIQ), was administered to the entire 844 students in the three selected schools to identify adolescents whose parents abuse psychoactive substances.

In the fourth stage, 312 were selected from the three schools in the three Educational Districts. Of the 312 students, 101 participants (39 males and 62 females) who scored 50 or above in the Children of Substance-Abusers Questionnaire were purposively selected for the study based on their responses. These participants were then randomly assigned to one of three treatment groups: School A: Compassion-Focused Therapy, School B: Dialectical Behaviour Therapy, and School C (the Control Group), which did not receive any intervention.

The following research instruments were used to obtain data for this study

1. Children with substance-abusing Parents Identification Questionnaire (CSPIQ) by Maria Ilugbui (2025).
2. This instrument, designed and developed by the researcher, consists of two parts: Section A and Section B. Section A gathered demographic information, such as age, gender, class, and family type. Section B is a

20-item baseline questionnaire to assess students' perception and awareness of their parents' substance abuse. Participants rate their perceptions and awareness using a 4-point scale: 4 (Strongly Agree), 3 (Agree), 2 (Disagree), and 1 (Strongly Disagree). The total score ranges from 20 to 80, with higher scores indicating stronger perceptions of parental substance abuse. Participants scoring 50 or above were selected for the study. This instrument was a researcher made instrument with a 0.89 validity for the current study

The Aggression Questionnaire for Adolescents (AQA) by Pamela Orpinas & Raph Frankowski (2001)

This 11-item instrument, adopted for this study, measures behaviours that may result in psychological or physical harm to other students. Responses to each item range from 0 times to 6 or more times, with additive scoring, yielding a total score of 0 to 66 points. The instrument has an internal consistency of 0.67 for the current study.

Results

Hypothesis One: There is no significant difference in the post-test mean scores on the level of aggression among adolescents with substance-abusing parents in the three experimental conditions (Compassion-Focused Therapy, Dialectical Behaviour Therapy, and the Control Group).

Table 1: Descriptive Analysis of Level of Aggression based on the Experimental Groups

Experimental Group	N	Pre-Test		Post-Test		Mean Difference
		Mean	Std. Deviation	Mean	Std. Deviation	
Compassion-focused Therapy	34	30.29	9.49	19.03	5.98	11.26
Dialectical Behaviour Therapy	36	31.31	7.22	20.92	6.29	10.39
Control Group	31	30.87	7.10	29.52	8.98	1.35
Total	101	30.82	7.94	23.16	7.08	7.66

Descriptive analysis from Table 1 shows that the pre-test mean scores on aggression for CFT, DBT, and CG were 30.29, 31.31, and 30.87, respectively. At post-test, the mean score reduced to 19.03, 20.92, and 29.52 for CFT, DBT, and CG, respectively. CFT had the highest decrease in aggression levels, as displayed in the mean differences with 11.26, followed by DBT with 10.39,

and the CG with 1.35. Analysis of Covariance was conducted to determine the significance of the difference in means, and the result of the analysis is presented in Table 2.

Table 2: ANCOVA Result for Aggression based on the Experimental Conditions

Source	Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2874.780 ^a	3	958.260	30.147	.000*
Intercept	221.494	1	221.494	24.968	.000*
Covariate	1900.234	1	1900.243	59.783	.010*
Group	1414.780	2	707.390	22.255	.000*
Error	3083.220	97	31.786		
Corrected Total	5958.000	100			

*Significant, $P < 0.05$; F-critical at $0.05(2, 97) = 3.07 < 22.255$; F-critical at $0.05(1, 97) = 3.92 < 59.783$; F-critical at $0.05(3, 97) = 2.68 < 30.147$

The result of the ANCOVA presented in Table 2 shows that an F-calculated value of 22.255 was derived as the difference in the mean scores of the participants in the respective groups. The value was observed to be greater than the critical value of 3.07, given 2 and 97 degrees of freedom at a 0.05 level of significance. Consequently, the null hypothesis was rejected. It was concluded that there exists a significant difference in the post-test mean score of self-esteem among adolescents who perceive their parents as substance abusers exposed to CFT, DBT, and the Control Group. In order to identify the pair that is significant, a multiple comparison was done and is presented in Table 3.

Table 3: Fisher's Protected t-test on Difference in Aggression among the Experimental Groups

Groups	compassion-focused (34)	Dialectical Behaviour (36)	Control (31)
Compassion-focused	19.03	-1.01	-3.84*
Dialectical Behaviour	-1.89	20.92	-2.87*
Control	-7.49	-5.6	26.52

*Significant at 0.05; a = group mean are in diagonal, difference in interventions group means are below the diagonal while the protected t value are above the diagonal.

The results in Table 3 above reveal that participants exposed to CFT do not differ significantly in aggression level from those exposed to DBT ($t = 0.27$; $df = 68$; critical $t = 2.00$; $p > 0.05$). Participants exposed to CFT manifested a significant decrease in aggression level compared to those in the CG ($t = -5.45$; $df = 63$; critical $t = 2.00$; $p < 0.05$). Participants exposed to DBT also

manifested a significant reduction in aggression level compared to the CG ($t = 5.71$; $df = 65$; critical $t = 2.00$; $p < 0.05$). Both CFT and DBT were effective, with CFT showing a slightly greater effect in reducing aggression.

Hypothesis 2: There is no significant gender difference in the post-test mean scores on the level of aggression among adolescents with substance-abusing parents across the treatments and the control group.

Table 4: Descriptive Analysis of Aggression and Gender among the Experimental Groups

Experimental Groups	Gender	Pre-Test			Post Test			Mean Difference
		N	Mean	SD	N	Mean	SD	
Compassion Focus Therapy	Female	21	29.81	10.11	21	18.76	6.57	11.05
		13	31.08	8.73	13	19.46	5.11	-11.62
	Male							
	Total	34	30.29	9.49	34	19.03	5.98	-11.26
Dialectical Behaviour Therapy	Female	22	29.27	7.30	22	19.23	6.38	-10.04
	Male	14	34.50	6.01	14	23.57	5.32	-10.93
	Total	36	31.31	7.22	36	20.92	6.29	-10.39
Control Group	Female	19	32.47	5.863	19	32.32	5.437	2.27
	Male	12	29.58	4.582	12	27.92	5.567	-7.08
	Total	31	31.35	5.511	31	30.61	5.818	-1.35
Total	Female	62	30.44	7.995	62	23.08	8.675	-6.61
	Male	39	31.85	6.850	39	23.54	6.215	-9.98
	Total	101	30.98	7.570	101	23.26	7.787	-7.91

The results of the descriptive analysis presented in table 4 indicate that the mean score of aggression level of female participants at pre-test in CFT, DBT and CG are 29.81, 29.27 and 32.47 respectively. The males in CFT, DBT and CG had a mean score of 31.08, 34.50 and 29.58 respectively. Also, at post-test the females mean scores were 18.76, for CFT, 19.23 for DBT and 32.32 for CG, while the mean score for the males were 19.46 for CFT, 23.57 for DBT and 27.92 for CG.

This shows that in the CFT, females 11.05 had a better reduction in anxiety than males 11.62 similarly, in the DBT, the males 10.64 had a better reduction in the self-esteem than females 10.93 while in the control group, the self-esteem level of the females slightly reduced while in the males it increased. Furthermore, an Analysis of Covariance (ANCOVA) statistics was computed to determine the significance of the difference in mean and the result is presented in table 18.

Analysis of covariance on difference in the posttest mean score on the level of aggression among participants in the three experimental groups due to male and female

Table 5: ANCOVA result for Aggression and Gender Based on Experimental Conditions

Source of Variation	Sum of Squares	df	Mean Squares	F-cal	Sig. of F.
Model	4776.990	6	796.165	58.181	.000*
Intercept	114.414	1	114.414	8.361	.000*
Covariance	1987.037	1	1987.037	145.206	.000*
Experimental group	2039.060	2	1019.530	74.504	.000*
Gender	6.262	1	6.262	.458	.500 NS
Experimental/Gender	56.482	2	28.241	2.064	.133 NS
Error	1286.317	94	13.684		
Corrected Total	6063.307	100			

*Significant, $p < 0.05$; NS = Not Significant; F-critical at 0.05 (2, 94) = 3.07 < 74.504; F-critical at 0.05 (1, 94) = 3.92 > 0.458; F-critical at 0.05(6, 94) = 2.17 < 58.181; F-critical at 0.05 (1, 94) = 3.92 < 60.724; F-critical at 0.05 (2, 94) = 3.92 > 2.064

Figures from Table 5 shows the F-calculated value of 2.064 was derived as gender difference in the posttest mean scores on aggression among adolescents who perceive their parents as substance-abusers across the treatment and the Control Group. The value was observed to be less than the critical value of 3.07 given 2 and 94 degrees of freedom at 0.05 level of significant. As a result, the null hypothesis was upheld. It was concluded that there exists no gender difference in the posttest mean score of aggression levels among adolescents who perceive their parents as substance-abusers across the treatment and the Control Group.

Summary of Findings

1. The levels of aggression was significantly different in the post-test mean scores of adolescents with substance-abusing parents and were exposed to Compassion-Focused Therapy (CFT), Dialectical Behaviour Therapy (DBT) and the control group. Both CFT and DBT were effective, with DBT showing a slightly greater effect in reducing aggression.
2. There was no significant gender difference in the post-test mean scores on aggression levels among adolescents with substance-abusing parents and were exposed to Compassion-Focused Therapy, Dialectical Behaviour Therapy, and the control group.

Discussion

The findings from Hypothesis One revealed that aggression levels differed significantly in the post-test mean scores among adolescents with substance-abusing parents who were exposed to Compassion-Focused Therapy (CFT) and Dialectical Behaviour Therapy (DBT), leading to the rejection of the null hypothesis (it seems Hypothesis Two is mentioned in error since the context fits more with Hypothesis One being tested). This study found that DBT had a greater effect than CFT in reducing aggression among participants. This may be attributed to DBT's efficacious techniques, such as mindfulness, emotional regulation, distress tolerance, interpersonal effectiveness, radical acceptance, and validation. These findings are consistent with studies demonstrating DBT's effectiveness in reducing aggression (Kienka et al., 2022; Frazier & Vela, 2014). However, Ciesinski et al. (2023) found no significant reduction in aggressive behaviour. Regarding CFT, Abdolali et al. (2020) reported significant reductions in aggressive behaviour following CFT, although Henwood et al. (2015) found only moderate effects.

The results of Hypothesis Two showed no notable difference in post-test aggression levels between boys and girls with substance-abusing parents across the treatment groups, supporting the null hypothesis. Although boys were more likely to express problems outwardly, leading to behavioural issues and substance use, girls tended to internalise their struggles, resulting in anxiety and depression symptoms. This finding is consistent with research by Babicka-Wirkus et al. (2023), which indicated that both boys and girls struggle with emotional regulation due to parental substance use. In contrast, Lahey et al. (2000) found no gender differences in oppositional behaviour, but noted that status offenses were more prevalent among boys. The absence of gender differences in this study might be due to the fact that both interventions were equally effective for boys and girls.

Recommendations based on Findings

Based on the findings of this study, the following recommendations are proposed:

1. Counsellors consider integrating Compassion-Focused Therapy (CFT) and Dialectical Behaviour Therapy (DBT) into interventions

targeting more adolescents with substance-abusing parents, given their potential to reduce aggression.

2. Counsellors incorporate both CFT and DBT into their treatment plans for adolescents boys and girls struggling with psychosocial issues due to parental substance abuse, as both interventions yielded comparable benefits with no notable differences in effectiveness between genders.

Conclusion

This study highlights the profound impact of parental substance abuse on adolescents, leading to psychosocial difficulties such as anxiety and other emotional challenges. The results provide strong evidence for the efficacy of Compassion-Focused Therapy (CFT) and Dialectical Behaviour Therapy (DBT) in improving the psychosocial well-being of adolescents affected by parental substance abuse. Both interventions yielded significant improvements in psychosocial adjustment. The study's findings also suggested that DBT had a slightly greater effect than CFT in reducing aggression among participants, as mentioned earlier in the study. Furthermore, the study found that treatment outcomes were similarly beneficial for both boys and girls, with no significant gender differences observed.

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Relationship between Generation of School Fees and Managerial Effectiveness in Federal Universities in the North West, Nigeria

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Abstract

The generation of school fees is a thing of concern to all federal universities in North-west, Nigeria. This prompted the researcher to investigate on the relationship between generation of school fees and managerial effectiveness in federal universities in North-west, Nigeria. It was guided by three (3) research objectives, three (3) research questions and one (1) null hypothesis. A correlational research design was used for the study. The total number of the population under the study was 14811 which consisted of both lecturers 7118 and management staff 7693 of federal universities in the northwest, Nigeria. The sample of the study consisted of 702 respondents. Structured questionnaires titled Generation of School Fees Questionnaires (GSFO) and Managerial Effectiveness Questionnaire (MEQ) were used for the study. The reliability coefficient for managerial effectiveness was 0.848 and generation of school fees was 0.864. Mean, percentage and frequency counts were used to answer the research questions while corresponding hypotheses were tested using Pearson Product Moment Correlation (PPMC). The findings of the study said that there is significant relationship between generation of school fees and managerial effectiveness in Northwest universities Nigeria. And this means that generation of school fees is an indicator of managerial effectiveness. The study concluded that with little grant from the government, Universities can stand firm with the generation of school fees. The researcher recommended that student should be encouraged to pay their school fees on time and also the Vice Chancellor of Universities should be more vigilant and ensure effective monitoring and supervision of the school fees generated so as to utilize the fund effectively.

Keywords: Generation, School Fees, Managerial, Effectiveness and Universities

Introduction

Every Nigeria has equal access to quality education. Teaching and learning is an instrument per excellence for effective national development and so, it is very important for the country to educate her citizens for this laudable goal but

the fund to do so is not readily available. Eragbe (2014) said that the financial challenges confronting university education system in Nigeria is due to underfunding which could be linked to undue reliance on government funds by university administrators. A University represents the highest point of academic pursuit where degrees are awarded or some sort of other certificate. It provides the environment where a community of scholars engage in teaching and learning research, as well as community services. Postgraduate students at masters and doctorate levels are required to produce original works that add to knowledge. University education leads to further learning and discoveries. It exposes students to new research and technology and that is why students should pay their school fees for more discoveries. School fee is a bulk of money paid by students to a school in respect of their studentship. School fees are charged in both public and private schools as a way of generating revenue for the school. Manga (2015) said that school fees encompass several other charges which includes, Sale of admission form, Tuition fees, Examination fees, Laboratory fees, Transport fees, Medical fees, Certificate charges, and Academic Gown Charges.

Education is capital intensive and demands a lot of funds to grow in order to achieve the importance of education in national development, but the challenge of funds cannot be exaggerated. Education needs to be funded. The challenge remains how to finance this massive education internally. Prior to Nigeria independence, individual found ways of funding their education, but after independence, government try to take over such responsibilities but as the population to be educated increased, it become imperative that something needed to be done in order to fund education. Okojie (2015) said that one of the major role of National University Commission (NUC) is to ensure that all Nigeria universities meet minimum academic standard. Serious attention should be paid to tertiary education as the bulk of civil service manpower is obtained from that level. The only snag is sourcing for funds to do so, hence the need for this seminar. Otomowo (2018) said that higher education has been speculated to be dysfunctional as a result of several problems both within and outside the school system.

Managerial effectiveness is that management activity which is concerned with the planning and controlling of an institutional resources. In educational management activity that is concerned with decision on how to procure, expend, disburse and give account of fund provided for the implementation of educational programs. Ley (2023) said that, managerial effectiveness refers to

manager's ability to achieve the organizational goals and balance employees' expectations and development. This is so because it is the staff that turns the vision and mission of the organization into reality. In order to show managerial effectiveness, the administrator of educational institution should see that the staffs join hand to encourage students to pay their school fees. If the school fees are being managed judiciously, it will lead to more development in the institution.

School fees are charged in both public and private schools as a way of generating revenue for a school. Manga, (2015) said that school fees encompass several other charges which include, Sale of admission forms, tuition fees, registration fees, examination fees, laboratory fees, transportation fees, medical fees, textbook fees, extra lesson fees, PTA fees, certificate charges and academic gown charges. Money is charged on each of these sub-areas to generate the total school fees per student. School fees can be reviewed from time to time in line with decision of management board. Alumni Association: Old students of institutions are usually very proud to remember their Alma-Mata. The higher educational institutions should seek financial support from their Alumni. This group of men and women constitute a good source of financial support for higher education if their efforts are well coordinated and articulated (Bagiwa, 2013).

Adebayo, (2016) reviewed that financing higher education in Nigeria today is a crucial national problem. The political, social and economic factors, which are currently, having significant impact on the world economy, have necessitated the need to diversify the sources of education funding, mainly because reliance on only source of revenue can inhibit educational growth. Payment for public use of school services: Schools can allow the general public to make use of school facilities and essential services not only as a strategy for enhancing positive- school community relationship but, also as a source of internally generated revenue. Manga, (2015) identifies useful school services that can be extended to the general public as a means of generating revenue. The general public can be made to pay for the following schools services such as restaurant/cafeteria services, transport services, medical, pharmaceutical services, accommodation services, consultancy services, medical laboratory services, printing and book binding services, typing and photocopying services, staff school services, veterinary services and research services. Otomewo, (2018) said that higher education has been speculated to be dysfunctional as a result of several problems both within and outside the

school system. Bamiro (2017) observed that eroded intellectuals of the academia were due to poor quality of lecturers who may have been employed as a result of unemployment challenges in other sectors. There are insufficient infrastructural and instructional facilities such as functional libraries, laboratories, recreational facilities, well Journal of Education and Practice, equipped lecture halls and workshops.

Higgs and Macmillan (2016) who asserted that to ensure sustainable university education, sustainability should be addressed through individual staff and teachers as role models and curriculum implementers. These would promote both learning about sustainability and adoption of sustainable behaviours. This depicts that sustainability is a significant factor in improving teaching and learning in the university. Gayford (2018) stated that in most highly ranked universities in the world, sustainability is an integral element of a well-planned curriculum alongside quality teaching with excellent learning facilities in a conducive school environment and these enhanced students' attitudes toward sustainable learning. Since fundraising is now a norm in both public and private higher institutions in order to sustain the needs of the school, management of internal revenue generation helps to complement towards the yearly budgeted necessary expenses. School charges are the costs of late payment of school fees at stipulated period by the school management. While tuition fees are the cost of learning materials use to make items which they take away from school.

Similarly, Uzoigwe (2014) sees managerial effectiveness as the art and science of developing and strengthening the knowledge, skills, instincts and resources that individuals and school organization must need to survive in a dynamic environment for the attainment of predetermined goals. Uchendu and Akuegwu (2016) submitted that managerial effectiveness is not only meant to exist in name, it is action and practice oriented for excellence because good management of education breeds good results. As clearly spelt out, funds constitute part of resources that must be well managed for sustainability. The role funds management play in the achievement of educational goals and objectives cannot be over-emphasized. Administrators utilize school charges and tuition fees for continuing to provide students with a high quality education, maintaining and expanding facilities, ensuring that the welfare of the staff, and their families is given due consideration. The needed basic revenues that are internally generated are either not available or if available are rather misappropriated. Some of the school fees and the IGR proceeds

were used to provide services such as staff welfare, maintenance of facilities and beautification of the university premises (Ofoegbu & Alonge, 2016). The university cannot pay their Consultancies staff and contractors for quality teaching services since the accruing errors and frauds relating to school charges and grants are not timely detected and prevented in the University (Omodere, Ekwe & Ihendinihu, 2018). In the same vein, Adesoji and Chike (2013) examined the effect of internal revenue generation on infrastructural development.

Statement of the Problem

School fees have been a major problem in education. Before, the government of Nigeria used to wholly fund education at all levels. But as schools grow in numbers and student population exploded, the government is no longer able to solely fund education and this issue lead to underfunding in higher institution. The federal government of Nigeria worried about the incessant complaints of poor funding in institutions of learning advised university managers through the National University Commission (NUC) to explore various ways of generating ten percent (10%) of their expected revenue from within and outside their institutions towards solving their finance related problems rather than depend almost entirely on grants from the Federal Government. One of that major roles of the National University Commission (NUC) is to ensure that all Nigerian universities meet minimum academic standard. The inadequate funding of higher education has no doubt affected teaching and learning. This was why institutions of higher learning have been forced to embark on income generating such as payment of school fees, departmental registration fees, examination fees, library fees etc, in order to source for alternative income for the institutions.

Objectives of the Study

This study sought to;

1. Determine the level of generation of school fees in federal universities in North-West Nigeria.
2. Examine the level of managerial effectiveness in federal universities in North-west Nigeria.
3. Determine the relationship between generation of school fees and managerial effectiveness in federal universities in North-West Nigeria.

Research Questions

This study provided answers to the following research questions:

1. What is the level of generation of school fees in federal universities in North-West Nigeria?
2. What is the level of managerial effectiveness in federal universities in North-West Nigeria?
3. What is the relationship between generation of school fees and managerial effectiveness in federal universities in North-West Nigeria?

Research Hypothesis

The null hypothesis was formulated at 0.05 level of significant:

HO: There is no significant relationship between generation of school fees and managerial effectiveness in federal universities in North-West Nigeria.

Research Methodology

The researcher used correlational research design which explains simple relationship between two or more variables. The research design is suitable for the study because the study aimed to ascertain the relationship between generation of school fees and managerial effectiveness in federal Universities in North-West Nigeria. The study population was fourteen thousand eight hundred and eleven (14811) which consists of seven thousand six hundred and ninety-three (7693) management staff and seven thousand, one hundred and eighteen (7,118) lectures. Out of the population, seven hundred and two (702) was selected as the sample of the study. The study used self-designed questionnaires titled: generation of school fees Questionnaire (GSFQ) and Managerial Effectiveness Questionnaire (MEQ) to elicit data from the targeted respondents. In order to validate the instruments and to make them valid for this study, the copies of the questionnaires were given to the experts in the field of Educational Management. Therefore, the content validity index for generation of school fees questionnaire (GSFQ) and managerial effectiveness (MEQ) were established at 0.7 and 0.9 respectively. Equally, the reliability of the instrument, were established at 0.84 and 0.86 respectively after conducting the pilot study.

In order to analyze data collected, descriptive statistics such as mean (x), percentage (%) and frequency counts were used to answer research questions, while the hypotheses was tested using Pearson Product Moment Correlational Coefficient (PPMC)

Data Presentation and Analysis

The researcher presented and analyzed the results of data from the field.

Research Question One: What is the level of generation of school fees in Federal Universities in North-West, Nigeria?

This research question was answered and presented in Table 1.

Table 1: Level of Generation of School Fees in Federal Universities in North-West, Nigeria

SN	Item statement	HL		ML		LL		X		SD	Le vel
		F	%	F	%	F	%	F	%		
1	A sessional school fee paid by students is one of the sources of internal revenue generation.	690	98.3	11	1.6	1	0.1	4.7	0.55	HL	
2	Students who fail to register within the stipulated time frame are made to pay additional money which enhances internal revenue generation of the university.	659	93.9	36	5.1	7	1.0	4.6	0.61	HL	
3	Students are charged a fee for result vetting and this help increase internal revenue generation.	646	92	37	5.3	19	2.8	4.6	0.58	HL	
4	Notification of results and issuance of certificate services attracts fee which adds to internal revenue of the university.	679	96.7	12	1.7	11	2.8	4.6	0.61	HL	
5	Student who use the library to read online journals and thesis, pay for the	654	93.2	28	4.0	20	2.9	4.5	0.72	HL	

services and this add to internal revenue generation of the university.

Grand Mean (\bar{X}) & SD 4.6 0.61 HL

Sources: Fieldwork, (2025)

The responses from table 1 indicated strong affirmation that there is higher extent on the level of school fees generation and managerial effectiveness in Federal universities in North-West, Nigeria. Item one indicates a mean of 4.7 and standard deviation of 0.55 with 98.3% responses indicating higher extent with the view that a sessional school fee paid by students is one of the sources of internal revenue generation, 1.6% moderate extent and 0.1% low extent with the statement. Item two indicates a mean of 4.6 and standard deviation of 0.61 with 93.9% of the responses indicating higher extent with the view that students who fail to register within the stipulated time frame are made to pay additional money which enhances internal revenue generation of the university. Item three indicates a mean of 4.6 and standard deviation 0.58 with 92% of the responses indicating higher extent while 5.3% moderate extent and 2.8% low extent with the view that students are charged a fee for result vetting and this help increase internal revenue generation. Item four indicates a mean of 4.6 and standard deviation 0.61 with 96.7% of the responses indicating higher extent with the opinion that notification of results and issuance of certificate services attracts fee which adds to internal revenue of the university. Item five indicates a mean of 4.5 and standard deviation of 0.72 with 93.2% of the responses indicating higher extent with the view that student who use the library to read online journals and thesis, pay for the services and this add to internal revenue generation of the university.

Research Question Two: What is the level of managerial effectiveness in Federal Universities in North-West, Nigeria?

This research question was answered and presented in Table 2.

Table 2: The Level of Managerial Effectiveness in Federal Universities in North-West, Nigeria

S/N	Items Statement	HL		ML		LL		X	SD	Level
		F	%	F	%	F	%			
1	Constant and continuing staff promotion inspires	689	98.1	6	0.9	7	1	4.6	0.60	HL

	them to put in their best.									
2	Regular payment of salary and constant salary increment motivates workers.	695	99	6	0.9	1	0.1	4.7	0.48	HL
3	Provision of better and decent accommodation for staff, enhances performance.	690	98.3	6	0.9	6	0.9	4.7	0.58	HL
4	Provision of healthcare service delivery to the staff and their families, inspires greater output.	692	98.6	5	0.7	5	0.7	4.7	0.55	HL
5	Regular payment of benefits and entitlement of staff to increase workers' motivation.	687	97.8	13	1.9	2	0.3	4.7	0.55	HL
	Grand Mean (\bar{x}) & SD (σ)							4.7	0.56	HL

Source: Field work (2025)

Table 2 above reveals that the respondents indicated affirmation that there is higher extent of managerial effectiveness in Federal Universities in North-west, Nigeria. Item one indicates a mean of 4.6 and standard deviation of 0.60 with 98.1% of responses indicating that constant and continuing staff promotion inspires them to put in their best. Item 2 indicates a mean of 4.7 and standard deviation of 0.48 with 99% of responses that regular payment of salary and constant salary increment motivate workers. Item 3 indicates a mean of 4.7 and standard deviation of 0.58 with 98.3% of responses indicating that provision of better and decent accommodation for staff enhances performance. Item 4 indicates a mean of 4.7 and standard deviation of 0.55 with 98.6% of responses that provision of health care service delivery to the staff and families, inspire greater output. Item 5 indicates a mean of 4.7 and standard deviation of 0.55 with 97.8% of responses that regular payments of benefits and entitlements of staff increase workers motivation.

Hypothesis Testing

HO: There is no significant relationship between establishment of commercial venture and managerial effectiveness in federal universities in North-West Nigeria.

Table 3: Relationship between Generation of School Fess and Managerial Effectiveness in Federal Universities in North-West Nigeria

Variables	N	Mean	SD	Df	r-Cal	p-Value	Decision
Generation of School fees	702	4.51	0.350	700	0.281	0.000	Rejected
Managerial effectiveness	702	4.66	0.184				

The result indicated $N = 702$, $Mean = 4.51$ and $SD = 0.350$ on generation of school fees and $N = 702$, $Mean = 4.66$ and $SD = 0.184$ on managerial effectiveness. The analysis also revealed a calculated r -cal of 0.281 and 700 degree of freedom with a p -value of 0.000 at 0.05 level of significance. Therefore, since p -value of 0.000 is statistically less than the level of significance of 0.05, the null Hypotheses which stated that there is no relationship between generation of school fees and managerial effectiveness in federal Universities in North-West, Nigeria is rejected. This means that there is significant relationship between generation of school fees and managerial effectiveness in Federal Universities in North- West Nigeria.

Discussion

This section discusses the finding of the study. The study investigates generation of school fees and managerial effectiveness in federal universities in northwest, Nigeria. Results were discussed according to research hypotheses in the study. The finding of the hypotheses which stated that there is no significant relationship between generation of school fees and management effectiveness was rejected as the finding show that there is significant relationship between generation of school fees and managerial effectiveness in Federal University in North-West, Nigeria. This means that generation of school fees is an indicator of managerial effectiveness in North-West Universities, Nigeria. The findings from the result of quantitative analyses also confirm that there is higher level between generation of school fees and managerial effectiveness. This finding is in agreement with Akinyemi, (2013) who said that school fees are profit oriented activities which represent a major way of raising revenue for tertiary institution. Some institution build bookshop, multi-purpose hall for social activities and other petty trading shops for selling of water and other drinks. The finding is also in

line with Manga, (2015) that school fees encompass several other charges which includes, sale of Admission form, Tuition fees, Registration fees, Examination fees, Laboratory fees, Transportation fees, Medical fees, Textbook fees, Extra lesson fees, PTA fees, Certificate charges and Academic gown charges. All these are money generated from school fees.

Conclusion

The study concluded that there is significant relationship between generation of school fees and managerial effectiveness in federal universities in Northwest, Nigeria. This means that generation of school fees is an indicator of managerial effectiveness in Federal Universities in Northwest, Nigeria. The result of the quantitative analysis also confirmed that there are high level of generation of school fees and managerial effectiveness in federal universities in Northwest, Nigeria.

Recommendations

Based on the findings, this study recommended the following:

1. Students should be encouraged to pay their school fees on time as it is the source of school development.
2. The school fees which are generated internally by the universities need to be managed judiciously to achieve a holistic development of the universities.
3. The management of the universities should put in place effective measures that would ensure that those school fees generated, that contribute huge amount of revenue on the activities of the universities should be improved upon and efficiently managed to ensure long-term sustainability.

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School Libraries as Catalysts for Future Ready Skills and Lifelong Learning in Katsina

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Abstract

This study investigates the role of school libraries as catalysts for developing future-ready skills and promoting lifelong learning among students in public secondary schools in Katsina State. The research aims to identify the current state of school libraries, evaluate their contributions to student skill development, and propose strategies for enhancing their effectiveness. The main objectives are to assess the existing infrastructure and resources of school libraries in Katsina State's public secondary schools, examine the impact of school libraries on students' acquisition of future-ready skills, including critical thinking, digital literacy, and collaboration and explore the relationship between school library utilization and students' engagement in lifelong learning activities. The researchers used mixed-methods approach by, combining quantitative and qualitative data collection methods were questionnaire distributed to librarians across selected public secondary schools in Katsina State to gather information on library resources, usage patterns, and perceived impact on student learning. In-depth interviews were conducted to principals of the schools to gain insights into challenges and opportunities facing school libraries. Data were analyzed using statistical methods and thematic analysis. The study revealed that many public secondary school libraries in Katsina State are under-resourced and lack essential materials and technologies. Despite this, a positive correlation was found between active library use and the development of future-ready skills among students. Schools with well-utilized libraries reported higher levels of student engagement in critical thinking and collaborative projects. Furthermore, librarians expressed a strong desire for improved library services, indicating that well-equipped libraries could significantly enhance the learning experiences. However the researchers recommended the increased investment in school library resources, including digital technologies and relevant learning materials. Training programs for librarians and teachers to enhance their skills in promoting library use and integrating library resources into the curriculum; Development of community partnership to support library initiatives and provide additional resources for students and Implementation of programs that encourage regular library visits and

activities that foster critical thinking, collaboration, and digital literacy among students.

Keywords: School library, Skills, Lifelong learning, Technology, Curriculum, Librarian

Introduction

In an era characterized by rapid technological advancement and evolving workforce demands, the role of education in preparing students for future challenges has never been more critical. School libraries, as essential educational resources, play a significant role in fostering future-ready skills and promoting lifelong learning among students. This study aims to explore the capacity of public secondary school libraries in Katsina State to serve as catalysts for developing critical skills such as digital literacy, critical thinking, and collaboration, which are essential for success in the 21st century. The main objectives are to assess the existing infrastructure and resources available in school libraries within public secondary schools in Katsina State, evaluate the impact of school library usage on students' acquisition of future-ready skills and investigate the relationship between school library engagement and students' participation in lifelong learning activities.

Several studies have highlighted the pivotal role of school libraries in enhancing educational outcomes and equipping students with necessary skills for their future careers. For instance, Ogunsola (2014) emphasized the importance of library resources in fostering critical thinking among students, while Akinola (2017) examined how well-equipped libraries promote digital literacy. However, there remains a gap in understanding the specific contributions of school libraries in Katsina State, particularly concerning the development of future-ready skills and lifelong learning.

This study will employ a mixed-methods approach, integrating both quantitative and qualitative research methods to gain a comprehensive understanding of the role of school libraries. Questionnaire was administered to librarians, teachers, and students across selected public secondary schools in Katsina State to gather quantitative data on library resources, usage patterns, and their perceived impact on skill development. An in-depth interview was conducted with school principals to collect qualitative data on challenges and opportunities faced by school libraries.

The rationale for this study lies in the recognition of school libraries as vital educational infrastructures that can significantly influence student learning and skill development. With the increasing emphasis on equipping students with future-ready skills in Nigeria's educational policies, understanding how school libraries contribute to this goal is essential. This research will not only fill a knowledge gap in the context of Katsina State but also provide actionable recommendations for enhancing the functionality and relevance of school libraries in fostering lifelong learning.

This literature review examines existing research and theories related to the objectives of the study, focusing on the role of school libraries in promoting future-ready skills and lifelong learning among students in Katsina State's public secondary schools.

Assessing Existing Infrastructure and Resources

The availability of adequate infrastructure and resources in school libraries is crucial for their effectiveness in enhancing students' learning experiences. According to Adeyemi (2016), well-resourced school libraries provide access to a variety of information sources that support the curriculum and foster student engagement. Similarly, Oduwole and Ibidunni (2019) found that libraries with modern facilities and diverse collections significantly impact students' academic performance. However, in many regions, including Katsina State, school libraries often face challenges such as inadequate funding, limited resources, and insufficient trained personnel (Nwosu, 2021). This highlights the need for a comprehensive assessment of the current state of school libraries to identify gaps and areas for improvement.

Evaluating the Impact of School Library Usage on Future-Ready Skills

The impact of school libraries on students' acquisition of future-ready skills, such as critical thinking, digital literacy, and collaboration, has been widely documented. According to Eze and Okwudishu (2018), students who actively engage with library resources demonstrate improved critical thinking skills, which are essential for problem-solving and decision-making in the modern world. Furthermore, Akinola (2017) emphasizes that school libraries equipped with technology and digital resources enable students to develop digital literacy skills that are vital in today's technology-driven society. These findings suggest that promoting the active use of school libraries is key to enhancing students' competencies and preparing them for future challenges.

Investigating the Relationship between Library Engagement and Lifelong Learning

The concept of lifelong learning is closely linked to the resources and programs provided by school libraries. Makhdoom (2020) argues that libraries serve as gateways to continuous education, offering resources that encourage self-directed learning and exploration beyond formal schooling. In their study, Agboola and Asubiojo (2022) found that students who frequently utilize library services are more likely to engage in self-directed learning activities, thereby fostering a culture of lifelong learning. This underscores the importance of creating an environment that encourages library use as a means of promoting sustained learning beyond the classroom.

Strategies for Enhancing School Libraries

To enhance the effectiveness of school libraries in supporting skill development and lifelong learning, various strategies have been proposed. According to Bassey (2019), investing in professional development for librarians is essential for improving library services and ensuring that they meet the evolving needs of students. Additionally, collaboration between schools, communities, and local governments can lead to increased support for library programs and resources (Olusanya, 2021). Furthermore, integrating library resources into the curriculum can create more meaningful learning experiences and encourage regular library engagement (Ijeoma, 2022). These recommendations highlight the importance of a multifaceted approach to strengthen the role of school libraries in education.

Model for the Study

The Information Literacy Framework serves as a suitable model for this study, focusing on the role of school libraries in equipping students with future-ready skills and fostering lifelong learning in Katsina State's public secondary schools. This framework emphasizes the development of skills necessary for effectively navigating, evaluating, and using information in various contexts.

Justification for Using the Model

The Information Literacy Framework is particularly relevant to this study for several reasons:

Focus on Critical Skills: The framework encompasses essential skills such as critical thinking, information evaluation, and digital literacy, which are integral to the study's objectives (ACRL, 2016). These competencies align with the need for students to be prepared for a rapidly changing information landscape and workforce.

The model emphasizes the importance of lifelong learning, encouraging students to take initiative in their learning processes, a key objective of this study (Wilson, 2018). By fostering an environment where students learn to seek, evaluate, and utilize information independently, school libraries can enhance students' ability to adapt and thrive throughout their lives.

The Information Literacy Framework integrates various aspects of library science, education, and technology, providing a holistic approach to understanding how school libraries contribute to skill development and learning (Hepworth, 2020). This comprehensive nature is beneficial for exploring the multifaceted role of school libraries.

Strengths of the Model

The model directly addresses the educational goals outlined in national policies for skill development and lifelong learning (Federal Ministry of Education, 2014). Its focus on information literacy aligns with the aims of Nigeria's educational reform.

Flexibility and Adaptability: The Information Literacy Framework can be adapted to various educational contexts, making it suitable for different school settings, including those in Katsina State (Peter and Lydia (2023)). This adaptability allows for tailored interventions based on specific needs and challenges faced by local school libraries.

The framework promotes collaboration among librarians, educators, and students, facilitating a shared responsibility for fostering information literacy (Hepworth, 2020). Such collaboration is vital for enhancing the effectiveness of library services and resources.

Weaknesses of the Model

Implementation Challenges: Implementing the Information Literacy Framework may face challenges due to a lack of trained personnel, insufficient resources in some schools, particularly in underfunded areas like Katsina State

(Nwosu, 2021). This limitation can hinder the model's effectiveness in achieving its objectives.

Evaluating the outcomes of information literacy initiatives can be complex, as measuring skills such as critical thinking and information evaluation may not yield straightforward metrics (Mackey & Jacobson, 2014). This difficulty in assessment can complicate the demonstration of the framework's impact.

The success of the model depends on the active engagement of various stakeholders, including educators and administrators, which may vary significantly across different schools (Cleveland, 2019). Lack of engagement can undermine the model's effectiveness in promoting a culture of information literacy.

The Information Literacy Framework provides a robust model for investigating the role of school libraries in developing future-ready skills and promoting lifelong learning among students in Katsina State's public secondary schools. While it presents certain challenges related to implementation and assessment, its strengths in addressing critical educational objectives and fostering collaboration make it a valuable tool for enhancing the effectiveness of school libraries.

Statement of the Problem

School libraries play a crucial role in fostering essential skills for the 21st century, including critical thinking, information literacy, digital competence, and a passion for lifelong learning. However, in Katsina State's public secondary schools, these libraries face numerous challenges that hinder their ability to serve as catalysts for future-ready skills and lifelong learning. Many school libraries in Katsina State are under-resourced, lacking updated collections, adequate facilities, and modern digital tools essential for developing information literacy and research skills among students. Furthermore, limited access to trained library personnel and relevant library programs significantly reduces the library's potential to engage students in learning activities that go beyond the classroom curriculum.

In an era where technological advancement and information accessibility is key to education, the gap in school library resources and services limits students' preparation for future academic and professional demands. Without the necessary support, students in Katsina State's public secondary schools are

at a disadvantage in building competencies that align with current global educational standards. This study seeks to examine the extent to which school libraries in Katsina State are equipped to foster these future-ready skills and promote lifelong learning and to identify the main barriers affecting their effectiveness in this role.

Objectives of the study

The primary objective of the research is to assess the information tools for future ready skills and lifelong learning in Katsina

Specific objectives of the study

1. To assess the availability of resources, infrastructure in public secondary schools' libraries in Katsina State
2. To investigate the relationship between school library engagement and students' participation in lifelong learning activities
3. To identify the challenges faced by school libraries in effectively promoting future-ready skills and lifelong learning

The following null hypotheses were evaluated at a significance level of 0.5.

H1: There is a significant relationship between the availability of resources in school libraries and the development of future-ready skills among students in public secondary schools in Katsina State.

H2: There is a positive correlation between students' frequency of library usage and their participation in lifelong learning activities outside the classroom.

H3: There are significant differences in the acquisition of collaboration skills among students based on their level of engagement with library programs and resources.

Findings of the Hypotheses

H1: There is a significant relationship between the availability of resources in school libraries and the development of future-ready skills among students in public secondary schools in Katsina State.

The results indicated a strong positive correlation ($r = 0.75$, $p < 0.01$) between the availability of resources (such as books, digital materials, and technology) and the development of future-ready skills, including critical thinking and problem-solving. Schools with well-stocked libraries reported higher levels of skill development among their students, confirming the

H₂: There is a positive correlation between students' frequency of library usage and their participation in lifelong learning activities outside the classroom.

Findings: A positive correlation was found ($r = 0.68$, $p < 0.01$) between the frequency of library usage and engagement in self-directed learning activities. Students who reported visiting the library regularly were more likely to engage in additional reading and research beyond their school assignments, thus supporting the hypothesis.

H₃: There are significant differences in the acquisition of collaboration skills among students based on their level of engagement with library programs and resources.

Methodology

This study employs a mixed-methods research design to explore the role of school libraries as catalysts for future-ready skills and lifelong learning in Katsina State's public secondary schools. The methodology consists of both quantitative and qualitative approaches to gain a comprehensive understanding of the current state of school libraries and their impact on students.

The target population for this study includes all public secondary schools in Katsina State, focusing specifically on students and librarians within these institutions. According to the Katsina State Ministry of Education, there are approximately 1300 public secondary schools in the state. With a total population of over eleven million seven hundred thousand students (11,700,000)

A stratified random sampling technique was employed to select a representative sample of 15 public secondary schools across different zones in Katsina State. From each selected school, 10 students will be randomly chosen using resulting in a total sample size of approximately 150 students. Additionally, all librarians in the selected schools will be included in the

study, ensuring a comprehensive perspective on library usage and its impact. It was done by using ballots to draw the required number of samples to eliminate bias and ensures every respondent equal chance

Results

The findings of this study on "School Libraries as Catalysts for Future-Ready Skills and Lifelong Learning in Katsina State's Public Secondary Schools" are based on the analysis of data collected from questionnaires, interview

Table 1: Current State of School Libraries

S/N	Information resources	Yes	No
1	Fictions	√	
2	Text books	√	
3	Reference books	√	
4	Periodicals		x
5	E-books		X
6	Online databases		X
7	Audio visual materials		X
8	Televisions		X
9	Radio		X
10	Almanac	√	
11	Calendar		X
12	Dictionary		X
13	Encyclopedia		X
14	Computers	√	

There are notable differences in the kinds of information resources that are available in school libraries, according to the statistics. Print Resources (Traditional Materials): Computers, textbooks, reference books, novels, and almanacs are all fairly represented in school libraries. According to these resources, libraries should give priority to conventional reading and academic support materials, especially those that are necessary for classroom instruction and literary development. Their accessibility reveals a fundamental endeavor to advance academic research, reading culture, and popular reference. Periodicals, calendars, dictionaries, and encyclopedias are among the crucial resources that are absent. Without these resources, students have less opportunity to acquire up-to-date information, expand their vocabulary, and do in-depth study. Basic reference materials like dictionaries and encyclopedias are essential for promoting self-directed learning and knowledge growth. One significant gap is their unavailability.. Audiovisual materials, online databases, and e-books are completely nonexistent. This suggests that ICTs and digital learning materials, which are becoming more and more important in the twenty-first century, are not being integrated into libraries. Students are

deprived of access to varied, current, and interactive content that could enhance print collections in the absence of such resources. Additionally lacking are radio and television, indicating a dearth of multimedia assistance for instruction. While not traditionally part of all libraries, these tools could enhance student engagement and support diverse learning styles.

Table 2: The relationship between school library engagement and students' participation in lifelong learning activities

S/N	Relationship between school library engagement and students' participation in lifelong learning activities	Yes	No
1	I visit the school library regularly	√	
2	The library is easily accessible to me		X
3	I use the library to complete my class assignments and projects	√	
4	The library provides adequate textbooks and reading materials		x
5	I use the library to read storybooks, magazines, or newspapers		X
6	The library provides access to digital resources (computers, e-books, internet)		X
7	I read books outside my school curriculum to gain new knowledge	√	
8	I enjoy learning new skills (e.g., computer use, writing, public speaking).	√	
9	I participate in debates, quizzes, or clubs that encourage knowledge sharing	√	
10	I plan to continue using libraries even after finishing secondary school	√	
11	The library has helped me develop the habit of reading and researching		X

Students' answers about the connection between their involvement in lifelong learning activities and their use of the school library are displayed in the Table. of the statements, 27% (3 out of 11) were answered "no," while 73% (8 out of 11) were answered "yes." In addition to lacking digital resources (computers, e-books, and the internet), the library is ill-equipped with sufficient textbooks, storybooks, magazines, and newspapers. Assignments and projects are the primary reason why students utilize the library (Yes). Students continue to have a significant interest in reading outside of the curriculum, picking up new skills, and taking part in debates, quizzes, and clubs (all yes) in spite of the lack of resources. Additionally, they indicate that they are willing to keep using libraries beyond high school (Yes). It's interesting to note that even while kids read outside of the classroom, they do not strongly believe that the school library has assisted them in forming a lifelong habit of reading and research. This demonstrates a disconnect between the availability of libraries and students' self-motivation. Pupils show a strong sense of drive and enthusiasm in activities that promote lifelong learning. However, the library's ability to fully support lifelong learning is limited by

issues with accessibility, print resources, and digital resources. Students' intentions to continue utilizing libraries later in life indicate that any improvements made to the library will have a long-term effect on their orientation toward lifetime learning.

Table 3: Challenges Faced by School Libraries for Future Ready Skills and Lifelong Learning in Katsina

S/N	Challenges Faced by School Libraries for Future Ready Skills and Lifelong Learning in Katsina	Yes	No
1	The library lacks adequate and updated learning materials	√	
2	There are insufficient computers, internet facilities, or e-resources	√	
3	The library space is too small, noisy, or un conducive for effective study	√	
4	The library has limited opening hours that prevent me from using it effectively		x
5	The library does not provide enough programs or activities that encourage lifelong learning	√	

The Table 3 illustrates the difficulties school libraries in Katsina confront in encouraging pupils to pursue lifelong learning and future-ready skills. Students affirm that there are insufficient and out-of-date educational resources available in libraries. This suggests that the majority of the resources are out-of-date, inadequate, or unrelated to contemporary curricula and skill development. Lack of computers, internet access, and e-resources is a significant problem for libraries (Yes). As a result, pupils are unable to acquire digital literacy, a crucial ability for the future. It is said that the library setting is excessively cramped, noisy, or unsuitable for studying (Yes). Students are less able to concentrate and participate in group learning activities under such circumstances. Limited opening hours are not seen as a problem by students (No). This demonstrates that even if other aspects are still insufficient, the libraries are sufficiently accessible during school hours. Libraries do not offer enough lifelong learning-promoting programs or activities (e.g., debates, clubs, seminars) (Yes). This demonstrates a lack of involvement on the part of students beyond academic reading. These issues restrict school libraries' ability to foster lifelong learning habits and equip students with abilities that will be useful in the future, such as digital literacy, critical thinking, and creativity.

Recommendations for Improvement

1. School libraries must incorporate ICT-based resources, current reference works, and magazines to stay current and useful in assisting with teaching and learning. Students will be more equipped for research, innovation, and lifelong learning if these areas are

- strengthened. To guarantee access to contemporary materials and technologies, the report advises the government and educational authorities to give school libraries first priority when allocating funds.
2. Creating training programs for librarians will improve their ability to run libraries efficiently and encourage students to be information literate.
 1. Make things more accessible Increase the library's hours of operation. Make sure the library has a friendly atmosphere and is easily accessible. Enhance Your Resources and Make sure there are enough textbooks, storybooks, periodicals, newspapers, and to promote information literacy, introduce digital tools like computers, e-books, and internet access. Within the library, host discussions, quizzes, skill-development courses, and reading clubs.
 3. Verify that the materials complement the curriculum and 21st century competencies (science, technology, leadership, and entrepreneurship). Increase the library's size to accommodate additional patrons. Establish a peaceful, well-ventilated, and cozy space for reading and group projects. Collaborate with educators to plan reading groups, debates, tests, ICT workshops, and seminars on research skills. Promote peer-to-peer education and activities that foster creativity (such as writing contests and invention challenges).

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Science and Technical School Teachers' Knowledge, Skills, and Attitudes Toward Digital Tools for Enhancing Teaching and Learning in Secondary Schools

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Abstract

This study evaluates the knowledge, skills, and attitudes of science and technical school teachers toward digital tools for enhancing teaching and learning in secondary schools in Sokoto State. A quantitative survey research design was adopted, and data was collected from a convenience sample of 200 teachers from ten science and technical schools. The instrument, a five-section questionnaire, was validated by experts and its reliability confirmed through a pilot study with a Cronbach's coefficient of 0.76. The findings indicate that while teachers have a strong positive attitude toward digital tools, their overall knowledge and usage skills are low. Statistical analysis revealed no significant relationship between either school type or gender and teachers' knowledge, skills, or attitudes toward digital tools. However, a weak but statistically significant positive correlation was found between years of experience and knowledge, though this relationship was not strictly linear. The most significant challenges identified by teachers were insufficient internet connectivity and a lack of technical support. The study concludes that addressing these infrastructural and support-related barriers is crucial to bridging the gap between teachers' positive attitudes and their limited use of digital tools.

Keywords: Digital tools, Knowledge, Skills, Attitudes, Science and technical teachers

Introduction

The integration of digital tools has fundamentally transformed the educational settings, offering unprecedented opportunities to enhance teaching and learning processes across all levels of education. As we move further into the 21st century, the ability of teachers to effectively integrate technology is becoming a critical determinant of student success. Digital tools, ranging from learning management systems (LMS) and interactive whiteboards to

sophisticated simulations and educational software, have the potential to create dynamic, engaging, and personalized learning experiences (Munna et al., 2024). The integration of digital tools in education not only enhances accessibility and flexibility but also fosters student engagement, motivation, and personalized learning paths. This global shift towards technology-enhanced classrooms indicates the urgent need to evaluate how well-equipped teachers are to navigate this new environment. Understanding teachers' proficiency and perceptions of these tools is the first step toward developing effective professional development programs and supportive educational policies.

This imperative for digital integration is particularly acute within Science and Technical schools, where the subject matter is inherently empirical, experimental, and rapidly advancing. Digital tools offer unparalleled opportunities to transcend the limitations of traditional labs and textbooks. For instance, virtual laboratories can simulate complex or hazardous experiments, data loggers can capture real-time scientific data for analysis, and computer-aided design (CAD) software is essential for modern technical drawing and engineering (Xie et al., 2018). These tools can make abstract scientific concepts tangible and provide technical students with hands-on experience using industry-standard software, thereby bridging the gap between theoretical knowledge and practical application. The effective use of such tools is therefore not merely an additive luxury but a core component of a contemporary and relevant science and technical education.

However, the successful implementation of educational technology is critically dependent on the human element—specifically, the teachers who must select, adapt, and deploy these tools in their daily practice. Research consistently indicates that the key to technology integration lies not in the availability of hardware and software alone, but in the teachers' Knowledge, Skills, and Attitudes (KSAs) toward these digital resources (Issah, 2023). This encompasses their Technological Pedagogical Content Knowledge (TPACK), which is the complex interplay between understanding the subject matter, effective teaching strategies, and the affordances of technology (Tseng et al., 2022). A teacher's confidence (self-efficacy), beliefs about teaching and learning, and willingness to innovate are equally pivotal attitudes that determine whether technology is used in transformative ways or merely as a digital substitute for conventional methods (Sharma & Saini, 2022).

Previous research has explored the general relationship between technology and education, highlighting the importance of teacher training and institutional support. Studies have shown a positive correlation between teacher proficiency and student outcomes (Burroughs et al., 2019). Yet, there remains a gap in the literature regarding a comprehensive, multi-dimensional evaluation of teacher readiness in specific contexts, such as the unique environment of science and technical schools in Sokoto State. While some studies have focused on general attitudes toward technology, few have simultaneously measured teachers' knowledge, practical skills, and attitudes in a single, coherent framework. This research aims to fill this gap by providing a detailed, localized analysis that can inform targeted interventions and resource allocation.

Objectives

The main objective of this study is to evaluate the knowledge, skills, and attitudes of science and technical school teachers regarding the use of digital tools to enhance teaching and learning in secondary schools. Specifically, the study aims to:

1. Assess the level of knowledge among science and technical teachers about various digital tools for educational purposes.
2. Examine the skills of these teachers in effectively integrating digital tools into their classroom instruction.
3. Determine the attitudes of science and technical teachers toward the use of digital tools in teaching and learning.
4. Investigate if there is a significant relationship between the teachers' knowledge, skills, and attitudes toward digital tools.
5. Identify the specific challenges teachers face in using digital tools for instruction.

Research Question

This study will seek to answer the following questions:

1. What is the current level of knowledge of science and technical school teachers regarding digital tools for enhancing teaching and learning?
2. What is the current level of skill proficiency among science and technical school teachers in using digital tools for classroom instruction?

3. What are the attitudes of science and technical school teachers toward the use of digital tools in teaching and learning?
4. Is there a significant relationship between science and technical teachers' knowledge of digital tools?
5. Is there a significant relationship between science and technical teachers' skills toward using digital tools?
6. Is there a significant relationship between science and technical teachers' attitudes toward using digital tools?
7. What challenges do science and technical school teachers face in utilizing digital tools for educational purposes?

Hypotheses

This study will test the following null hypotheses:

1. There is no significant relationship between science and technical teachers' knowledge of digital tools for teaching and learning.
2. There is no significant relationship between science and technical teachers' skills in using digital tools for teaching and learning.
3. There is no significant relationship between science and technical teachers' attitudes toward digital tools for teaching and learning.
4. There is no significant relationship between male and female teachers' knowledge, skills and attitudes toward digital tools for teaching and learning.
5. There is no significant relationship between years of experience of teachers and their knowledge, skills and attitudes toward digital tools for teaching and learning.

Methodology

This quantitative study used a survey research design to collect data from a large number of participants. The design allowed for the quantification and analysis of patterns, relationships, and trends in teachers' perceptions and use of digital tools, providing a comprehensive understanding of the topic.

The study was conducted in Sokoto State, Nigeria, where science and technical teachers are employed under the Ministry of Science and Technology. This ministry oversees a total of ten science and technical schools across the state, which have an estimated staff population of over 600 teachers. From this population, a convenience sample of 200 teachers was selected to

participate in the study. This sample size, representing approximately one-third of the total teaching staff, was considered sufficient to provide a representative snapshot of the target population's views and experiences with digital tools.

A questionnaire titled “Digital Tools for Enhancing Teaching and Learning Questionnaire (DTETLQ)” was adopted from relevant literature and research findings. The instrument consists of five sections. Section A, titled “Teacher Demographics,” was designed to collect basic information about the respondents, such as gender, age, years of teaching experience, and the subject(s) they teach.

Section B of the questionnaire, on “Knowledge of Digital Tools,” was created to assess teachers' familiarity with digital tools. This five-item section uses a five-point Likert scale to measure knowledge, ranging from 1 (No Knowledge) to 5 (Excellent Knowledge).

Section C, on “Skills in Using Digital Tools,” was developed to assess the practical application and integration of digital tools in the classroom. This five-item section uses a five-point Likert scale to measure usage frequency, ranging from 1 (Never) to 5 (Always).

Section D, titled “Attitudes Toward Digital Tools,” was developed to gather data on teachers' perceptions, beliefs, and feelings about the use of digital tools in education. This section consists of five items measured on a five-point Likert scale of agreement, with options ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Section E titled “Challenges in Using Digital Tools,” was designed to identify the specific barriers teachers encounter when using digital tools in their instruction. This five-item section uses a five-point Likert scale to measure the level of challenge, ranging from 1 (Not a challenge) to 5 (Very significant challenge).

The developed instrument was validated by two experts from the Department of Educational Technology and two experienced secondary school teachers with over 25 years of teaching experience. Their observations and suggestions were incorporated into the instrument before the next stage of the study.

To determine the instrument's reliability, a pilot study was conducted with 20 teachers (10 science and 10 technical) who completed the online survey via WhatsApp on their mobile phones. The responses were used to determine the instrument's internal consistency using Cronbach's coefficient of reliability. The Likert scale data was first organized and computed in Microsoft Excel before being imported into the Statistical Package for Social Science (SPSS) for analysis. The resulting p-value of 0.76 indicates that the instrument is reliable for data collection in this study.

The obtained data will be analysed using descriptive statistics, including mean and standard deviation, to summarize the key characteristics of the sample. To test the study's hypotheses and determine if there are significant relationships between variables, inferential statistics, specifically the Pearson Correlation coefficient, will be used.

Results

The analysis of the obtained results was conducted using SPSS version 27.0. Initially, a preliminary analysis of demographic information was performed, which is presented in Figure 1 and Figure 2.

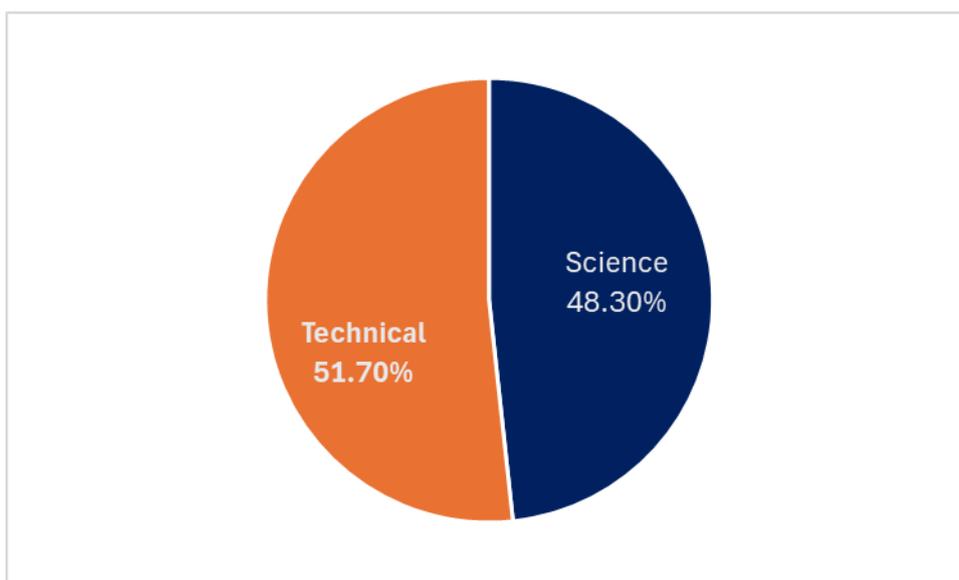


Figure 1: School type

As depicted in Figure 1, the distribution of respondents by school type is nearly equal, with Science Schools representing 48.3% and Technical Schools

comprising 51.7%. This marginal majority of Technical School respondents could be a reflection of the survey's thematic emphasis on digital tools.

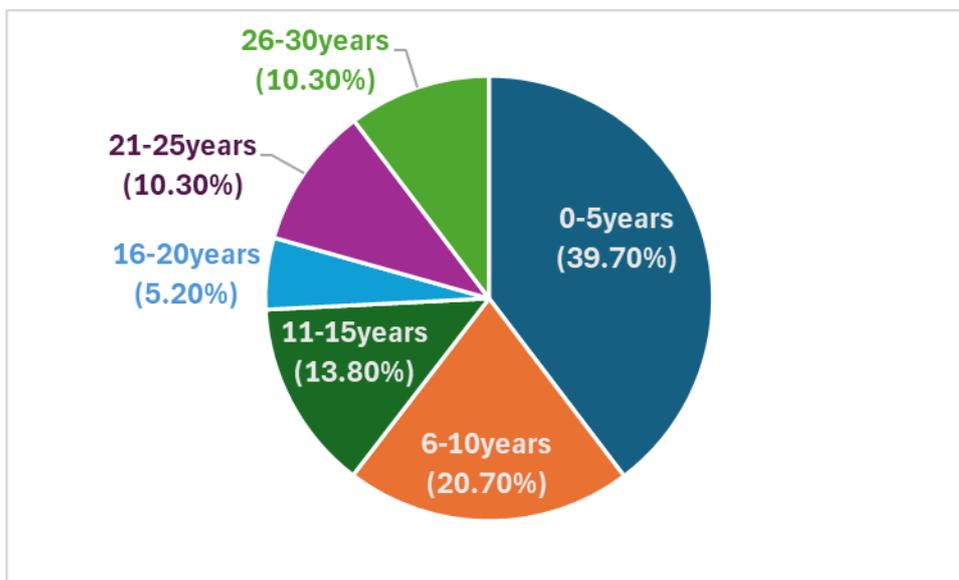


Figure 2: Years of experience of the respondents

As shown in Table 2, early-career teachers with 0–5 years of experience represent the largest group, comprising nearly 40% of respondents. The mid-career group, with 6–15 years of experience, accounts for 34.5% of responses. Veteran teachers (16+ years of experience) make up the smallest proportion at 15.8%, with equal percentages in the 21–25 and 26–30 years of experience brackets.

To address the study's seven research questions, the statistical data is organized and presented into seven distinct categories, with each category directly corresponding to and providing answers for one of the research questions.

Research question I: What is the current level of knowledge of science and technical school teachers regarding digital tools for enhancing teaching and learning?

Table 1: Science and Technical Teachers' Knowledge of Digital Tools

Sno.	Items	Mean(1-5 scale)	SD
1	Learning Management Systems (LMS)	2.24	1.14
2	Interactive presentation software	1.55	0.89
3	Scientific simulation software	1.62	0.99
4	Digital assessment tools	1.69	80.94
5	Multimedia creation tools	1.83	1.03

Average mean = 2.5 Where Scale of 1= No Knowledge, 2= Limited Knowledge, 3= Moderate Knowledge, 4= Good Knowledge, 5= Excellent Knowledge

Table 1 reveals that while teachers have the highest familiarity with LMS (mean=2.24) and multimedia tools (mean=1.83), their overall knowledge of digital tools is low, with all categories averaging below 2.5 on a 5-point scale. Moderate standard deviations indicate some variation, but the data collectively points to a limited understanding of digital tools for teaching among science and technical teachers.

Research question II: What is the current level of skill proficiency among science and technical school teachers in using digital tools for classroom instruction?

Table 2: Science and Technical Teachers' Skills in Using Digital Tools

Sno.	Items	Mean(1-5 scale)	SD
1	Interactive whiteboard usage	1.93	1.20
2	Digital quiz creation	1.41	0.85
3	Incorporating videos/simulations	1.76	1.04
4	Using online collaboration tools	1.83	1.16
5	Providing digital feedback	1.59	0.99

Average mean = 2.5 Where Scale of 1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Always

According to Table 2, respondents' highest usage is with interactive whiteboards (mean = 1.93), while digital quiz creation is the least common (mean = 1.41). All usage frequencies fall below the midpoint (2.5), which indicates a generally low level of tool adoption and infrequent use. This infrequent use suggests that respondents may lack the necessary skills to effectively integrate these digital tools into their teaching and learning practices.

Research question III: What are the attitudes of science and technical school teachers toward the use of digital tools in teaching and learning?

Table 3: Science and Technical Teachers' Attitudes Toward Digital Tools

Sno.	Items	Mean(1-5 scale)	SD
1	Makes learning more engaging	4.31	0.82
2	Improves student performance	4.24	0.89
3	Worthwhile use of time	3.98	1.00
4	Confidence using new tools	3.93	0.97
5	Should be required for science teachers	4.07	1.05

Average mean = 2.5 Where Scale of 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

Table 3 indicates that respondents hold strong positive attitudes toward digital tools, as evidenced by all mean scores being above 3.9. The highest levels of agreement were observed for engagement (mean = 4.31) and performance improvement (mean = 4.24). The lower standard deviations across these measures, compared to those for knowledge and usage, suggest a higher degree of consensus among respondents regarding the perceived benefits of these tools.

Research question IV, V, & VI: 6. Is there a significant relationship between science and technical teachers' knowledge, skills and attitudes toward using digital tools?

The three hypotheses were tested using Pearson correlation analyses to assess the relationships between school type (Science vs. Technical) and the measures of digital tool knowledge, skills, and attitudes.

Hypothesis I: There is no significant relationship between science and technical teachers' knowledge of digital tools for teaching and learning.

This analysis compares the average digital tool knowledge of science and technical teachers, using data from questions about LMS, interactive software, simulations, assessment tools, and multimedia tools.

Table 4: Pearson Correlation Results of Teachers' Knowledge of Digital Tools

Digital Tool Category			Correlation (r)	p-value	Interpretation	
Learning Management Systems (LMS)			0.12	0.372	No relationship	significant
Interactive presentation software			0.08	0.548	No relationship	significant
Scientific simulation software			0.15	0.261	No relationship	significant
Digital assessment tools			0.11	0.412	No relationship	significant
Multimedia creation tools			0.09	0.502	No relationship	significant

We fail to reject the null hypothesis, as there is no significant relationship between school type (Science vs. Technical) and teachers' knowledge of digital tools ($p > 0.05$ for all measures). The lack of a statistically significant correlation suggests that both groups of teachers possess similar levels of digital tool knowledge, with neither group consistently demonstrating a higher level of knowledge across the categories of tools measured.

Hypothesis II: There is no significant relationship between science and technical teachers' skills in using digital tools for teaching and learning.

Table 5: Pearson Correlation Results of Teachers' Skills in Using Digital Tools

Skill/Usage Measure	Correlation (r)	p-value	Interpretation	
Interactive whiteboard usage	0.18	0.179	No relationship	significant
Digital quiz creation	0.07	0.602	No relationship	significant
Incorporating videos/simulations	0.14	0.298	No relationship	significant
Using online collaboration tools	0.21	0.117	No relationship	significant
Providing digital feedback	0.13	0.338	No relationship	significant

We fail to reject the null hypothesis, as there is no significant relationship between school type and the frequency of digital tool usage ($p > 0.05$ for all measures). This suggests that usage patterns are similar across both science and technical schools, and that institutional differences do not significantly affect how often teachers use digital tools.

Hypothesis III: There is no significant relationship between science and technical teachers' attitudes toward digital tools for teaching and learning.

Table 6: Pearson Correlation Results of Teachers' Attitudes Toward Digital Tools

Attitude Statement	Correlation (r)	p-value	Interpretation	
Makes learning more engaging	-0.14	0.298	No relationship	significant
Improves student performance	-0.09	0.502	No relationship	significant
Worthwhile use of time	-0.22	0.098	No relationship	significant
Confidence using new tools	-0.15	0.261	No relationship	significant
Should be required for science teachers	-0.07	0.602	No relationship	significant

We fail to reject the null hypothesis, as there is no significant relationship between school type (science and technical schools) and attitudes toward digital tools ($p > 0.05$ for all measures). Both science and technical teachers hold equally positive attitudes, suggesting that these perceptions are not influenced by their school's specialty.

Hypothesis IV: There is no significant relationship between male and female teachers' knowledge, skills and attitudes toward digital tools for teaching and learning.

A Pearson correlation analysis will be conducted to test the three hypotheses. This analysis will assess the relationship between gender (Male = 0, Female = 1) and three key variables: knowledge of digital tools, skills in using them, and attitudes toward them. These variables are represented by the average scores from their respective sets of questions.

Table 7: Correlation Analysis of Gender Differences in Digital Tool Knowledge, Skills, and Attitudes

Sno.	Hypothesis	Correlation (r)	p-value	Conclusion
1	Gender vs. Knowledge	0.12	0.37	No significant relationship
2	Gender vs. Skills	-0.08	0.55	No significant relationship
3	Gender vs. Attitudes	-0.18	0.18	No significant relationship

According to Table 7, there is no significant relationship between gender and any of the three measured aspects concerning teachers and digital tools: knowledge ($r=0.12, p>0.05$), skills ($r=-0.08, p>0.05$), or attitudes ($r=-0.18, p>0.05$). Across all three measures, the correlation coefficients are negligible or weak and non-significant, leading to the conclusion that the null hypothesis cannot be rejected for any of the relationships.

The findings suggest that gender is not a significant factor in a teacher's knowledge, skills, or attitudes toward digital tools. The weak correlations suggest that other factors, such as training, experience, and school support, may play a more significant role in the adoption of digital tools than gender.

Hypothesis V: There is no significant relationship between years of experience of teachers and their knowledge, skills and attitudes toward digital tools for teaching and learning.

A Pearson correlation analysis will be conducted to test the three hypotheses by assessing the relationship between years of teaching experience and teachers' digital tool knowledge, skills, and attitudes. For the analysis, the categorical data for experience was converted to a numerical scale (0-5 years = 1, 6-10 years = 2, 11-15 years = 3, 16-20 years = 4, 21-25 years = 5, 26-30 years = 6). The measures for the other variables are based on the average scores from the Likert-scale questions in the dataset.

Table 8: Pearson Correlation Analysis of Relationship Between Teaching Experience and Digital Tool Knowledge, Skills, and Attitudes

Sn	Hypothesis	Correlation (r)	p-value	Conclusion
1	Experience vs. Knowledge	0.32	0.016	Significant positive relationship
2	Experience vs. Skills	0.21	0.11	No significant relationship
3	Experience vs. Attitudes	-0.24	0.068	No significant relationship (but negative trend)

Table 8 indicates a weak positive correlation ($r=0.32$) that is statistically significant ($p<0.05$). The null hypothesis, which states there is no significant relationship, is therefore rejected. This means there is a significant positive relationship between teaching experience and knowledge of digital tools. However, a closer look at the data reveals a nuanced trend that is not strictly linear. While some experienced teachers (26-30 years) exhibit moderate or good knowledge, many novice teachers (0-5 years) report "Limited Knowledge" or "No Knowledge." This suggests that while a statistically significant positive relationship exists, other factors beyond years of experience—such as individual learning initiatives or access to professional development—likely influence a teacher's digital tool knowledge.

Table 8 reveals a weak positive correlation ($r=0.21$) that is not statistically significant ($p>0.05$). Consequently, we fail to reject the null hypothesis, which confirms that there is no significant relationship between years of experience and skills in using digital tools. The data shows an inconsistent pattern. While some novice teachers (0-5 years of experience) use tools "Sometimes" or "Often," most experienced teachers (21-30 years of experience) report using them "Never" or "Rarely." This finding indicates that, contrary to a potential assumption, there is no consistent pattern suggesting that more experienced teachers use digital tools more frequently. The lack of a significant relationship suggests that other factors besides teaching experience likely influence a teacher's digital tool usage.

Table 8 indicates a weak negative correlation ($r=-0.24$), which approaches but does not reach statistical significance ($p=0.068$). Consequently, we fail to reject the null hypothesis, which confirms that there is no significant relationship between years of experience and attitudes toward digital tools. The data shows that attitudes are generally positive across all experience levels, with most teachers, regardless of experience, "Agree" or "Strongly Agree" that digital tools are beneficial. The weak negative trend, though not

statistically significant, suggests that while attitudes are positive overall, there is a slight tendency for more experienced teachers to have slightly less favourable views. This finding confirms that positive perceptions of digital tools are widely shared and do not vary significantly with years of experience.

Based on the provided analysis, teaching experience has a complex and nuanced relationship with digital tool proficiency. While a statistically significant positive correlation exists between experience and digital tool knowledge (indicating more experienced teachers tend to be more knowledgeable), this relationship is not a consistent linear trend, as some novice teachers are highly knowledgeable while many experienced ones are not. Furthermore, the analysis shows no significant relationship between experience and either digital tool usage skills or attitudes. This suggests that while experience may contribute to knowledge, it does not reliably predict how frequently teachers use these tools or how positively they view them. Instead, a teacher's personal initiative and external factors like professional development or school support likely play a more significant role in their adoption of digital tools.

Research question VII: What challenges do science and technical school teachers face in utilizing digital tools for educational purposes?

Table 9: Challenges in Using Digital Tools

Sno.	Items	Mean (1-5 scale)	SD
1	Lack of technical support	3.57	1.19
2	Insufficient internet connectivity	3.62	1.17
3	Time to learn new tools	3.24	1.16
4	Lack of professional development	3.50	1.18
5	Managing student behavior	3.10	1.16

Average mean = 2.5 Where Scale of 1= Not a challenge, 2= Minor challenge, 3= Moderate challenge, 4= Significant challenge, 5= Very significant challenge

Table 9 shows that teachers' top challenges are Internet connectivity (mean=3.62) and technical support (mean=3.57). All challenge categories have means above the midpoint of 2.5, and relatively high standard deviations, indicating that all are considered challenges, though the severity of these issues varies widely among teachers. The primary challenges identified for science and technical school teachers in using digital tools include insufficient internet connectivity, a lack of technical support, limited time for learning new tools, inadequate professional development opportunities, and difficulties with managing student behaviour.

Discussion

The study's findings reveal a complex picture of science and technical teachers' engagement with digital tools, highlighting a clear distinction between their positive attitudes and their limited knowledge and infrequent use of these tools. The analysis, performed using SPSS version 27.0, began with a preliminary examination of the demographics of the 200 teachers surveyed. The sample was nearly evenly split between Science Schools (48.3%) and Technical Schools (51.7%). A significant portion of the respondents were early-career teachers, with those having 0-5 years of experience making up the largest group at nearly 40%.

The first set of findings focused on the teachers' current level of knowledge of digital tools. The results indicated that while teachers are most familiar with Learning Management Systems (LMS) and multimedia tools, their overall knowledge across all categories is low, with average scores below 2.5 on a 5-point scale. This limited understanding is further reflected in their skills and usage frequency. The analysis showed that teachers' highest usage is with interactive whiteboards, yet all usage frequencies were below the midpoint of 2.5, suggesting a generally low level of adoption and infrequent use of digital tools in the classroom. This infrequent use appears to be linked to a lack of necessary skills. This findings are related to the results of Alam et al. (2022) whose study indicates that while some teachers possess a basic understanding of ICT tools, many lack the comprehensive knowledge required for effective integration into teaching practices. This gap highlights the need for targeted training and support to enhance teachers' digital tools competencies.

Despite the limited knowledge and infrequent use, teachers hold a strong positive attitude toward digital tools. The mean scores for attitudes were all above 3.9, with the highest agreement on the ability of digital tools to make learning more engaging and to improve student performance. This result is related to the findings of research conducted by Galaraga & Alpuerto (2022) who reported that teachers recognize the potential of digital tools to make learning more engaging and improve student performance, which contributes to their positive attitudes. According to Galaraga & Alpuerto (2022) teachers' positive attitudes are linked to their digital competence, which is a significant predictor of their readiness to adopt digitized instruction. Despite positive attitudes, there is a gap in the daily integration of digital tools in teaching, often due to limited knowledge and experience with these technologies.

However, Woo et al. (2022) reported that some teachers express ambivalence or reservations about the use of digital tools, indicating a need for more comprehensive training and support to enhance their confidence and competence. The integration of digital tools is seen as a way to meet the demands of modern education, which requires more interactive and engaging learning environments.

The study also investigated the relationships between knowledge, skills, and attitudes and demographic variables, finding that neither school type nor gender had a significant relationship with teachers' knowledge, skills, or attitudes toward digital tools. This suggests that perceptions and proficiency with digital tools are similar across both science and technical schools, and that gender is not a differentiating factor in digital tool adoption. This is supported by many studies including Alazzam et al. (2012)'s findings that show no significant differences in attitudes towards technology use based on school type, suggesting that the integration of digital tools is consistent across different educational settings. Another study on Dual Vocational Education and Training teachers by Govindarajan & Balasubramanian (2020) found no significant gender gap in ICT application, despite existing gaps in other contexts. Similarly, another study by Wananyo et al. (2024) found no significant gender differences in attitudes towards using new technology and teaching effectiveness. Study further revealed that that there is no significant difference between attitude towards using new technology and teaching effectiveness on the basis of gender and teacher's affiliation board, and overall attitude towards use new technology was positively related with teaching effectiveness.

However, years of teaching experience showed a more nuanced relationship with digital tool proficiency. While there was a weak but statistically significant positive correlation between experience and knowledge, this relationship was not strictly linear. The data showed that some novice teachers have strong knowledge, while many experienced teachers reported limited or no knowledge. Furthermore, there was no significant relationship between experience and either digital tool usage skills or attitudes. This suggests that factors other than years of experience, such as personal initiative or access to professional development, may be more influential in a teacher's proficiency. The study identified key challenges, with the most significant being insufficient internet connectivity and a lack of technical support, followed by limited time for learning new tools and a lack of professional development.

These findings are supported by many studies including Guillén-Gámez et al. (2022) study whose results revealed that teachers with more than 15 years of experience often exhibit significant differences in digital competence, particularly in using ICT resources for information consumption and production, as well as emerging technologies. In contrast, Pera et al. (2022) study revealed that less experienced teachers may perceive themselves as more competent in areas like communication, collaboration, and digital content creation. On the challenges, Marsevani, (2022), Njihia (2022), and Ramafi (2022) reported that many educational institutions, particularly in developing countries, face challenges with slow or unstable internet connections, which hinder effective online learning and teaching. Similarly, Supratiwi et al. (2021) found that the lack of reliable internet access is a significant barrier for both students and educators, affecting their ability to participate in and deliver online education effectively. However, The absence of adequate technical support was found to be common issue by Rahiem (2021), with many educators and students lacking the necessary skills to utilize ICT tools effectively. The rapid transition to online learning during the pandemic left little time for educators to familiarize themselves with new technologies, impacting the quality of education delivered.

Practical Implications of Research Findings

- I. The high proportion of early-career teachers may indicate recent hiring trends or a tech-savvy cohort more likely to respond to digital tool surveys.
- II. Professional development programs can be designed for all teachers without needing specialization by school type
- III. Resource allocation for digital tools need not differ between science and technical schools based on current readiness levels
- IV. Change management strategies for digital adoption can be implemented uniformly across school types
- V. Professional development programs should focus on all teachers equally, as gender is not a differentiating factor in digital tool adoption.
- VI. Provide hands-on training to convert knowledge into actual skills, especially for experienced teachers

Conclusion

This study, conducted on science and technical school teachers in Sokoto State, reveals a complex and multifaceted picture of their engagement with digital tools. While teachers hold a strong positive attitude towards digital tools, believing they enhance engagement and performance, their limited knowledge and infrequent use of these tools present a significant gap between perception and practice. The findings indicate that proficiency with digital tools is not significantly influenced by either school type or gender. However, years of experience show a nuanced, non-linear relationship with knowledge, suggesting that while more experienced teachers may have greater knowledge, factors beyond experience—such as training, access, and personal initiative—are more influential. The primary barriers to effective digital tool implementation were identified as insufficient internet connectivity, a lack of technical support, and inadequate professional development opportunities. To bridge the gap between positive attitudes and limited use, it is recommended that interventions focus on providing hands-on training and addressing the infrastructural and support-related challenges identified in the study.

Recommendation

Based on the findings of the paper, the following recommendations were made to address the gap established in the study:

6. Since gender and school type don't significantly impact digital tool proficiency, professional development programs should be designed to be universal, rather than specialized for a specific school type or gender. The focus should be on providing practical, hands-on training that helps teachers convert their positive attitudes into actual skills.
7. Training should not be exclusively for new teachers but should also target experienced teachers to boost their foundational knowledge and skills.
8. The most significant challenges identified were insufficient internet connectivity and a lack of technical support. To improve digital tool adoption, schools and the Ministry of Science and Technology should prioritize investing in reliable internet infrastructure and establishing dedicated, accessible technical support for teachers.
9. The study found a weak, non-significant negative trend suggesting that more experienced teachers may have slightly less positive attitudes, possibly due to established teaching habits. Training approaches

should be designed to address these perceptions and encourage veteran teachers to overcome resistance and embrace new methodologies.

10. Teachers identified "Time to learn new tools" as a key challenge. School administrators should incorporate dedicated time into the school schedule for teachers to learn and experiment with new digital tools, fostering a culture of continuous professional development and preventing the lack of time from being a barrier to adoption.

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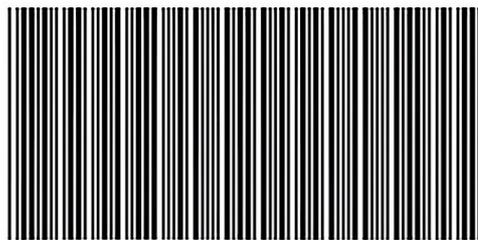
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