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Prof. M. U. Tambawal,
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Olufunminiyi Akinbobola

Impact of Discussion Method of Teaching on Academic Achievement of Islamic Studies Students in Kwara State

[1]*UMSAN ADISA ISSA, [2]AYUBA OLANIYI JIBRIL, [3]ABDULRAFIU JAMIU, [4]AHMAD TIJANI SURAJUDEEN, & [5]ARUNA ABDUL RASAK

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Abstract

This study investigated the impact of discussion method of teaching on academic achievement of Islamic Studies students in Kwara State. Quasi experimental research design was used in this study. The population for this study comprised all upper basic students of Islamic studies in Kwara State. Multi stage method of sampling was adopted in the study; stratified simple random, simple random and purposive sampling techniques were used. A fifty multiple choice questions adapted from Basic Education Examination Certificate (BECE) and lesson plan designed on *al-Adhan* (calling prayer), *al-Iqāmah* (commencement of prayer), *Salātul Jamā'ah* (congregational prayer) and Islamic greeting were used as instrument for the study. Descriptive statistic tools such as percentage, mean and standard deviation were used to describe demographic data of the participants and answer the research questions raised in the study. ANCOVA was the inferential statistical tool used for testing hypotheses generated in the study. The findings of the study revealed that discussion method is one of the effective methods of teaching Islamic Studies in upper basic schools in Kwara State. The findings also revealed that there is significant effect of discussion method on upper basic students' academic achievement in Islamic Studies in Kwara State. The study, therefore, recommended that upper basic Islamic Studies teachers should be trained on how to effectively use discussion method for teaching.

Keywords: Upper basic student, discussion method, academic achievement

Introduction

Teaching is an act of cultivating knowledge, skills and experience through writing, reading, explaining, illustrating among others and the task is expected to be done by qualified teachers in the schools. According to Iornem (2016), teaching is regarded as a way of writing, reading, explaining, illustrating, dramatising, assessing, rewarding, giving punishment and showing appreciation in order to help students acquire some skills or change some attitudes. Sequeira (2018) defined teaching as well-designed activities structured to process learning in order to receive feedback from the students. Boma (2019) described

teaching as a human profession that needs special attention, wisdom, perseverance, dedication and sincerity. This implies that teaching could be done through series of interconnected activities such as; writing, reading, explaining, and assessing to mention a few. Similarly, teaching is a fundamental phase in the process of imparting knowledge to the students in the schools by transferring knowledge, norms, culture, traditions and beliefs through writing, reading, explaining, assessing, rewarding and reprimanding.

Teaching in Islam is an act of worship which earns man rewards from the sight of Allah as it is clearly mentioned in the Hadith of Prophet Muhammad (pbuh) that the best among you is the one who knows Qurān and teaches it to others (Sahih Al-Bukhari, n.d). Ta'lim is domesticated to mean teaching and it is an act cultivating, guiding, inculcating, instructing among others. Therefore, teaching (Ta'lim) is an act of cultivating Islamic values, morals, thoughts and a host of others in students with the aim of making him to become a responsible vicegerent of Allah on the earth (Mamoun, 2009; Taj-Uddin & Saeed-ul Abrar, 2019). It is be opined that teaching is Islam needs to cover necessary aspects of knowledge that would aid man to understand this world and divine reasons for his creation and to know how he would work to attain the highest level of commendation from Allah and other human beings.

The methods used by the teachers in teaching determine students' comprehension, assimilation and understanding of lesson and eventually improve learners' outcomes. Omwirhiren and Ibrahim (2016) defined teaching method as the tactics that teachers adopt purposely to achieve interaction objectives. Sanda and Mazila (2017) delineated teaching methods as the strategic way the teachers use to carry out teaching activities in the classrooms which includes planning, organisation and performance that could aid achievement of already set goals in education. Hussain (2020) described teaching method as the various techniques employed by the teachers to teach different concepts and ideas. Ai (2021) perceived teaching method as an instructional pedagogy used by the teachers to facilitate lessons in order to achieve instructional objectives in the schools. Alkali (2021) stated that effective teaching methods have positive and constructive effects on students' motivation and academic achievement. Islamic education is not left out in discussing teaching method. Ahmad (2011) explained that revelation of Qur-ān to Prophet (pbuh) was done through direct, lecture, discussion and demonstration methods.

Discussion method of teaching is an important teaching method widely adopted among the teachers to facilitate teaching and learning. Sanda and Mazila (2017) unveiled discussion method of teaching as a teaching method that centers on sharing of conversation, discussions and exchange of ideas which gives room for sit and listen, think and talk as well as the process of coming to know and knowing the right answer among the students. Discussion method of teaching is an interaction between the teacher and students in the classroom; it is normally organized to boost the understanding, innovativeness and creativeness of the students.

In Islamic point of view, discussion method of teaching is the exchange of views, ideas, opinions which can activate students' intellectual zeal, innovativeness and creativity (Zarnūjī, 2003). Similarly, Ahmad (2011) explained that Islam gives exceptional priority to dialogical discussion as it is explicitly mentioned in the Qur'ān and teachings of Prophet Muhammad (pbuh) especially when it comes to religious discussion between Muslim and non-Muslim where each of them need to explain the fundamental principles upon which sound faith is based without dispute or fight. To justify this assertion, Qurān says:

> *"Say: "O People of the Book! Come to common terms as between us and you:*
> *that we worship none but God; that we associate no partners with*
> *Him; that we erect not, from among ourselves, lords and patrons*
> *other than God."…." (Sūratu Āl'imaran; Q3, V 64).*

From the above stated verse it could be understood that having dialogical discussion on a matter that can add value to understanding of religion is allowed in Islam. This had showed that Islamic education has gone far in explaining rich methods of teaching that can enhance students' self-reasoning and thinking.

Corroborating the above Quranic verse, it is clear that teaching is a profession that should be handled by qualified, certified and competent teachers who would take the job with zeal and passion. It is therefore, observed that availability of workable curriculum, syllabus, good lesson plan and a host of others teaching resources would not yield effectiveness when the teachers are unable to use appropriate and relevant methods of teaching like discussion method. However, to effectively tackle the problems facing education in this contemporary period, teachers need to apply methods that can enhance students' creativity, self-efficacy, self-reliance among others. For that reason, this present study wished to check the impact of discussion method on Islamic Studies students' achievement in Kwara

State. Similarly, the study covered the general achievement of upper basic students in Islamic Studies, the impact of discussion method on upper basic Islamic Studies students' academic achievement and interaction impact of gender and discussion method on upper basic students' academic achievement of upper basic students in Islamic Studies.

Discussion method is a method of teaching where students shares views, ideas and opinions among themselves on a particular issue and it is very effective in building students' self- reliance, self-efficacy, boldness, creativity and innovativeness. Kabir (2020) observed that discussion method is vibrant and effective method that can help education stakeholders achieve educational goals in the 21st century. Ayub et al. (2019) submitted that discussion method of teaching prepares students for future challenges in the field of education. Alkali (2021) is of the opinion that discussion method of teaching is one of effective teaching techniques that are encouraged to use this time around to make learning more resent and closer to the students. In the same vein, Sanda and Mazila (2017); Hussain and Omer (2023) submitted that discussion method of teaching provides students opportunity to build themselves through series of exchange of views and ideas that normally happen. All these discussions among them enrich their knowledge, personal and interpersonal behaviours.

In Islamic point of view, discussion method of teaching is the exchange of views, ideas, opinions which can activate students' intellectual zeal, innovativeness and creativity (Zarnūjī, 2003). Similarly, Ahmad (2011) explained that Islam gives exceptional priority to dialogical discussion as it is explicitly mentioned in the Qur'ān and teachings of Prophet Muhammad (pbuh) especially when it comes to religious discussion between Muslim and non-Muslim where each of them need to explain the fundamental principles upon which sound faith is based without dispute or fight. To justify this assertion, Qurān says:

> *"Say: "O People of the Book! Come to common terms as between us and you: that we worship none but God; that we associate no partners with Him; that we erect not, from among ourselves, lords and patrons other than God."...." (Sūratu Āl'imaran; Q3, V 64).*

From the above stated verse it could be understood that having dialogical discussion on a matter that can add value to understanding of religion is allowed in Islam. Ahmad (2011) similarly, observed that

beginning discussion method with explanation of what is not yet clear or questioning leads to mutual understanding and acceptance of truth.

In the same vein, another justification supporting the availability, usability and acceptability of dialogical discussion method in Islam is a portion of Qurān where Allah says:

> *"When he (Ibrahim) said to his father and his people, what are these images, to which ye are (so assiduously) devoted?. They said: We found our fathers worshipping them. He said: "indeed ye have been in manifest error; ye and your fathers". They said: have you brought us the truth, or are you one of those who jest? He said: "Nay! Your Lord is the Lord of the heavens and the earth, He Who created them (from nothing)" and I am a witness to this (truth)" (Sūratul Anbīẏa; 21:52-56).*

The above Quranic injunctions had explored logical and systematic ways of implementing dialogical discussion method of convincing someone to accept the truth (Ahmad, 2011). It is apparent from the explanation that discussion method is one of the oldest methods of teaching in Islam. Ahmad (2011) demonstrated the recognition given to discussion method of teaching in Islamic education. Ahmad (2011) therefore, explained that discussion method is one of the method widely used in the revelation of Qur-ān due to its effectiveness.

Research Questions

The following research questions were answered during the conduct of this research;

1. what is the general performance of upper basic students in Islamic Studies?
2. what is the effect of discussion method on academic performance of upper basic students exposed to discussion method (treatment) in Islamic Studies?
3. what are the interaction effects of gender and discussion method on the upper basic Islamic Studies students' academic performance?

Research Hypotheses

The following null hypotheses were tested during the course of this research study;

H01: there is no significant effect of treatment (discussion method) on upper basic students' academic performance in Islamic Studies

H02: there is no significant interaction effect of gender and discussion method on upper basic Islamic Studies students' academic performance

Methodology

The study adopted quasi-experimental involving 3×2 non-randomisation research design. The target population was all upper basic students of Islamic Studies in Kwara State. A multi stage method of sampling was used in the study. Stratified simple random sampling technique was used to select Senatorial District in Kwara State, then a local government was sampled from the sampled Senatorial District using simple random sampling technique. Furthermore, purposive sampling technique was adopted in selecting two intact classes of upper basic III students where one was experimental group and the other represented control group. The sample comprised 30 students in experimental group I and 32 students in control group. An adapted fifty objective questions from Kwara State Basic Education Certificate Examination (BECE) on Al-Azan (calling prayer), Al-Iqamah (commencement of prayer), Salatul-Jama'h (congregational prayer) and Islamic greeting were developed to teach Upper Basic Islamic Students in Kwara State, Nigeria. Experimental group students were exposed to discussion method while control group students were exposed to traditional lecture method. The data collected were analysed using percentage to describe the demographic data of the respondent, mean and standard deviation to answer research questions 1 & 2 while ANCOVA was used to test all hypotheses at 0.05 level of significance.

Results

Table 1: 2×2 Pre-test Posttest Control Group Factorial Research Design

Groups	Pre-test	Treatment	Gender	Post-test
Experimental group I	**O_1**	**X_1**	**M & F**	**O_2**
Control group	**O_1**	-	**M & F**	**O**

Table 2: Demographic Data of the Respondents involved in the Study

Gender	Frequency	Percentage (%)
Male	27	43.5%
Female	35	56.5%
Total	62	100.0

Table 2 revealed that out of 62 respondents sampled for this study, 27(43.5%) respondents were male while 35(56.5%) of the participants

were female. This implied that percentage of female respondents was higher than the percentage of male participants. This confirmed the high priority Nigeria government has attached to female education and its enrolment in the country.

Answering Research Questions

Research question 1: what is the general Achievement of upper basic students in Islamic Studies?

Table 3: Academic Achievement of upper basic students in Islamic Studies

Academic Achievement	N	Minimum	Maximum	Mean	Std. Deviation
Discussion Method	30	45.00	80.00	64.5333	9.99908
Traditional Lecture Method	32	15.00	70.00	48.9063	11.34036

Table 3 revealed that upper basic students taught Islamic Studies using discussion method of teaching mean score of 64.53 with standard deviation of 9.99 while students taught using traditional lecture method has 48.91 mean score and 11.34 standard deviation. This that discussion method has high mean scores which indicated that discussion method is highly effective for teaching Islamic Studies than traditional method of teaching.

Hypotheses Testing

H01: there is no significant effect of discussion method on upper basic students' academic achievement in Islamic Studies

Table 4: Analysis of Covariance Results of the Effect of Discussion Method on upper basic Islamic Studies Students' Academic Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Correlated Model	3951.479[a]	2	1975.739	17.357	.000
Intercept	8810.320	1	8810.320	77.399	.000
Pre-test	170.228	1	170.228	1.495	.0226
Discussion Method	3190.390	1	3190.390	28.028	.000
Error	6715.957	59	113.830		
Total	208361.000	62			
Corrected Total	10667.435	61			

a. R Squared = .370 (Adjusted R Squared .349)

Table 4 revealed that the F-value obtained was 28.028 with a p-value of 0.00 computed at 0.05 alpha level. Since p-value (0.000) is less than alpha level (0.05), the null hypothesis one is rejected. This indicated that there is significant effect of discussion method on upper basic students in Islamic Studies in Kwara State.

H02: there is no significant interaction effect of gender and discussion method on upper basic Islamic Studies students' academic achievement

Table 5: Analysis of Covariance Results of the Effect of Discussion Method and Gender on upper basic Islamic Studies Students' Academic Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Correlated Model	275.410[a]	1	275.410	1.587	.213
Intercept	218776.055	1	218776.055	1260.517	.000
Gender	275.410	1	275.410	1.587	.213
Error	10413.683	60	173.561		
Total	**235211.000**	**62**			
Corrected Total	**10689.048**	**61**			

a. R Squared = .26 (Adjusted R Squared .010)

Table 5 revealed that the F-value of 1.587 was obtained for gender with a p-value of .213 computed at 0.05 alpha level. Since p-value (.213) is higher than alpha level (0.05), the null hypothesis two is not rejected and thus, there is no statistically significant effect of gender and discussion method on Upper Basic Islamic Studies Students' academic achievement ($F_{(2, 61)} = 1.587$, p>0.05). It implied from analysis that there is no significant effect of gender and discussion method on upper basic Islamic Studies Students' academic achievement.

 Discussion

The finding of the study revealed that discussion method of teaching is highly effective for teaching Islamic Studies in upper basic schools in Kwara State. This was clearly showed in the table 3 when the mean score was 64.53. This however, implied that discussion method of teaching is one of the most effective methods for teaching Islamic Studies in upper basic schools in Kwara State. The findings of this study were in consonance with the findings of Sanda and Mazila (2017) that students taught using discussion method performed better in Social Studies than those taught using traditional lecture method in Borno State, Nigeria.

The findings of this study also revealed that there was significant effect of discussion method on upper basic students in Islamic Studies in Kwara State. The findings of this study was in agreement with the finding of Ayuba et al. (2019) whose findings revealed that discussion method had positive significant effect on the achievement of students in Islamic Studies in Quetta District, Pakistan.

Furthermore, the finding of this study revealed that there was no significant effect of gender and discussion method on Upper Basic Islamic Studies Students' academic achievement in Kwara State. This finding agreed with the finding of Hussain and Omer (2023) who established that there was no significant difference between male and female secondary school students' achievement in English Test of Oral in Nigeria. In another vein, the finding was not in agreement with the finding of Ayuba et al. (2019) that there was significant difference on the effect of discussion method between male and female achievement in Islamic Studies in Quetta, District Pakistan.

Conclusion

Based on the findings of the study it was concluded that discussion method of teaching is one of the effective methods for teaching Islamic Studies in Kwara State. The study also concluded that there are many things needed to streamline while using discussion method in teaching so that slow learners will also achieve like fast learners in the classroom.

Summary of the findings

1. The upper basic students that were taught using discussion method had the highest achievement in Islamic Studies in Kwara State.
2. There was significant effect of discussion method on upper basic students in Islamic Studies in Kwara State.
3. There was no significant effect of gender and discussion method on upper basic Islamic Studies Students' academic achievement in Kwara State.

Recommendations

The following are the recommendations based on the findings of the study:

1. Islamic Studies' teachers in upper basic schools in Kwara State should be trained on how to effectively use discussion method for teaching in Islamic Studies;
2. Islamic Studies teachers should develop interest in adopting 21st century effective methods of teaching because of their effectiveness in teaching;
3. All teachers should be trained on how to select and use appropriate methods of teaching to facilitate better achievement.

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Adult Education for Entrepreneurial Proficiency in Nigeria: Challenges and Way Forward

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Abstract

Adult education has long been recognized as a critical pathway for personal and societal development. This however indicates that, the evolving dynamics of global economies, driven by technological advancements and the need for self-sustenance, call for a retooling of adult education to foster entrepreneurial proficiency. Entrepreneurial proficiency is considered to be specific skills, knowledge and abilities required by entrepreneur to start and manage an enterprise successfully. The aim of this paper is to critically examine Adult education for entrepreneurial proficiency in Nigeria: challenges and way forward. The paper identified lack of entrepreneurial focus in curricula, inadequate infrastructure and resources, insufficient qualified educators and low participation and motivation as major challenges affecting entrepreneurial proficiency in Nigeria. The paper recommends overhauling of audited curriculum in adult education, introduction of modern technologies, Training and recruitment qualified staff and adequate funding and policy

Keywords: Education, Adult Education, Entrepreneurial Proficiency, Entrepreneurial skills

Introduction

The relevance of adult education can be rooted in the fact that human beings have capacity to learn and also require long-life learning for existence (Zuofa, 2017). Interestingly, majority of the populace including governments in Nigeria, do not understand what adult education is in the first instance as well as its relevance. Among various ways adult education has been explained is that it is a process whereby adults engage in systemic and sustained learning activities in order to gain new forms of knowledge, skills, attitudes or values (Merriam & Brockett, 2007). In this context, adult education is seen as a concept that is central to all human development. It also follows that adult education is a tool for awareness creation about issues individuals and societies gain from (Zuofa, 2017).

Adult education, is any organized, systematic educational activity carried within the classroom (Singh, 2010); or outside the formal education system to provide selected types of learning to adults and

children (UNESCO, 2010). Adult education is a deliberate process of communicating ideas and developing skills in adults to participate more intelligently in economic and civic programmes to achieve other personal and social goals. Adult Education is further described as programmes or activities to encourage individuals of all ages especially adults and youths to enhance their abilities and potentials through formal, informal and non-formal education (Zuofa, 2006). According to her, this education is based on the individual's economic cultural, political, religious and social needs which should enhance their perception to face immediate and future challenges. United Nations Education Scientific and Cultural Organization (UNESCO) (2011) explain adult education as an important component of lifelong learning. During the international conference on adult education held in December 4th to 9th 2009, held in Belem, Brazil, the concept was expanded to mean, the entire body of ongoing learning process, formal or otherwise, where by people regarded as adults by the society to which they belong develop their ability, enrich their knowledge and improve their technical or professional qualifications or, turn them in a new direction to meet their own needs and those of the society (Kanothi 2009). This definition is remarkable in that it is all embracing and recognizes the flexibility of mode of delivery to individual adults in their immediate environment for their development and participation in the larger societies.

Adult education plays a crucial role in the empowerment of individuals, especially in developing economies like Nigeria. It provides opportunities for skills acquisition, literacy improvement, and lifelong learning, crucial for personal and professional development. However, in a rapidly changing world dominated by innovation, digitalization, and entrepreneurial opportunities, Nigeria's adult education system remains poorly aligned with the economic realities that demand proficiency in entrepreneurship.

Entrepreneurship is not a new phenomenon in Nigeria, because the profile of the country with its diverse resources, attitude and culture encourages entrepreneurial education (Raimi, Sanni & Bello, 2010). When viewed as an academic endeavour, entrepreneurship can be defined as an act of inculcating specialized knowledge that entails teaching learners the skills of risk taking, innovation, arbitrage, and co-ordination of factors of production in the creation of products and services for economic needs (Kanothi, 2009).

Martina, Hana, and Jiri (2012) define entrepreneurial proficiency as a set of specific knowledge, abilities, skills, traits, motives, attitudes and values essential for the personal development and successful participation of each person in an organization. Rezaei-Zadeh, Hogan, O'Reilly, Cleary and Murphy (2014) define it as the abilities of the person that enable him to demonstrate the appropriate entrepreneurial behaviour including: identifying opportunities, start-up and maintenance of business. Sanda (2011) also refers to it as specific behaviour and characteristics of a person that result in effective or superior performance.

Paulienė, (2017) define entrepreneurial proficiency as a set of related knowledge, attributes and skills that give an individual the capability to perform an activity or task within a particular function or job. Entrepreneurial proficiency can be described as those characteristics exhibited by an individual that can be used to explain efficient, effective or superior performance in a given assignment. In defining competency of an entrepreneur, characteristic of risk taking is important without which profit making could be difficult (Pepple & Enuoh, 2020).

Entrepreneurial proficiency has also been defined to include some entrepreneurial behavior that enables an entrepreneur to identify business opportunities, set up and manage a business successfully with the identified opportunities (Yusoff & Lame, 2017).

Shane and Venkataraman (2000) argue that entrepreneurial proficiency is fundamentally about the ability to identify, evaluate, and exploit opportunities. They emphasize that proficient entrepreneurs have the cognitive and social skills to recognize opportunities that others may overlook and have the resourcefulness to bring these opportunities to fruition.

Entrepreneurial proficiency refers to the knowledge, skills, and competencies necessary to start, manage, and grow a business successfully. It involves understanding market trends, financial management, business strategy, and innovation. According to Hisrich and Peters (2002), entrepreneurship proficiency is not just about the ability to create a business but also the capacity to sustain and scale it in the face of competition and market dynamics.

Fayolle and Gailly (2008) discuss entrepreneurial proficiency as a key educational outcome of entrepreneurship programmes. They define it as the ability of an individual to effectively apply the knowledge, skills,

and attitudes acquired through education to real-world entrepreneurial activities. They emphasize that entrepreneurship proficiency is not innate but can be developed through targeted education and training programmes.

Garcia-Morales, Jimenez-Barrionuevo and Gutiérrez-Gutierrez, (2014) link entrepreneurial proficiency to innovation, suggesting that proficient entrepreneurs possess the skills to foster innovation within their businesses. They define proficiency as the capacity to implement new ideas, processes, or products that lead to competitive advantage. This definition underscores the importance of creativity, strategic thinking, and technological competence as key elements of entrepreneurship proficiency.

Retooling Adult education for entrepreneurship Proficiency in Nigeria

In many countries, adult education has been utilized to bring in equitable distribution of the opportunities of society (Singh, 2010). In the twenty-first century all individuals need to develop the capacity to be creative and innovative at work and in their communities, because the world of work is undergoing major transformations caused by technological change, shifts in the global economy, new business models, and demographics (Lindner, 2020). Not surprisingly, organizations like United Nation Educational Scientific and Cultural Organization UNESCO, the European Commission (EC), the Organization for Economic Co-orperation and Development OECD (2018), and the International Labour Organization (ILO) (2019) recognize the importance of enabling entrepreneurship as a way to drive growth. However, the perceived growth in entrepreneurship is to build the capacity of young adults to become self-employed. After all, young adults are often the first casualty when redundancy is declared at workplace. However, this step can be realized when education and training of young adults is placed high in high demand. Another observation is that sustainable enterprises are a priority for the whole education system (Lindner, 2020); including adult education.

King, (2017), noted that entrepreneurial training, organization of workshops, seminars, and symposia on small businesses in the communities (Biney, 2021), business training and start-ups management training and enhancement of confidence (Jonsdottir, 2006), and farmer training programmes and adult literacy programmes and occupational skill training (UNESCO, 2010) will be beneficial to young adults. This constitutes some examples of adult

education programmes. Youth clubs with educational purposes and community programmes of instruction in health, nutrition, family planning, cooperatives and entrepreneurship are also Adult education programmes (UNESCO, 2010).

Nafukho and Muyia (2010) argue that students who have taken an entrepreneurship course have learned to be creative and innovative, and should seek to be employment creators and not job seekers. However, such trained students can only be successful in their entrepreneurial drive when they continue to participate and get involved in short training programmes such as entrepreneurship workshops, seminars, and management bootcamps to build on their already acquired knowledge, skills, values and understanding. Such training programmes are Non Formal Education (NFE), and are practically oriented. The knowledge and skills acquired in the training programmes are immediately applied to solve problems (Shane & Venkataraman, (2000). This supports Singh's (2010) assertion that NFE focuses on the learner's needs, and uses the learner as a resource, and stresses on relevant activities and practical outcomes.

Challenges of Nigeria's Entrepreneurial Proficiency through Adult Education

Below are the major challenges that affect entrepreneurial proficiency through adult education:

1. Lack of Entrepreneurial Focus in Curricula

One of the major challenges facing adult education in Nigeria is the lack of entrepreneurial content in curricula. Adult education programmes have traditionally focused on literacy, with little regard for equipping learners with practical skills that can be applied to entrepreneurship. Akinyemi (2019) notes that while adult education in Nigeria has contributed to basic literacy, it has not adequately addressed the needs of learners who wish to start businesses or enhance their employability.

2. Inadequate Infrastructure and Resources

The infrastructural challenges in Nigeria also impact adult education. Many adult learners do not have access to modern educational resources such as computers, internet connectivity, or even basic learning materials (Akinyemi 2019). This lack of resources limits the ability of adult education centers to offer comprehensive training

programmes that include entrepreneurship skills. In rural areas, where entrepreneurship could be particularly transformative, the absence of necessary infrastructure severely constrains access to quality adult education (Yahaya, 2018).

3. Insufficient Qualified Educators

Another critical challenge is the shortage of qualified educators trained in both adult learning methodologies and entrepreneurship. Adult learners have unique educational needs that differ from those of younger students (Obanya 2011). Educators in adult education programmes must be able to provide practical, real-world insights into entrepreneurship. However, many adult education instructors in Nigeria lack the necessary background or training in business-related fields, which diminishes the effectiveness of entrepreneurship education (Ekong & Ekong, 2016).

4. Low Participation and Motivation

Adult education programmes in Nigeria also face low participation rates due to various socio-economic factors. Adults, particularly in rural and low-income areas, often cannot afford to leave their jobs or family responsibilities to attend educational programmes. Moreover, many do not see the immediate economic benefits of participating in education programmes that are perceived to be focused on literacy rather than practical skills (Adewumi, 2020). This reduces the appeal of adult education programmes, limiting their ability to produce proficient entrepreneurs.

Conclusion

Adult education plays a crucial role in the empowerment of individuals, especially in developing economies like Nigeria. It equips the adult learner with opportunities for skills acquisition, literacy improvement, and lifelong learning, crucial for personal and professional development. It is however mind blowing to say that rapidly changing world dominated by innovation, digitalization, and entrepreneurial opportunities, Nigeria's adult education system remains poorly aligned with the economic realities that demand proficiency in entrepreneurship.

Entrepreneurship proficiency refers to the combination of skills, knowledge, attitudes, and abilities that enable an individual to successfully initiate, manage, and grow a business venture. This proficiency goes beyond simply starting a business; it encompasses competencies that allow entrepreneurs to navigate challenges, seize opportunities, and innovate in the face of competition. As the global economy becomes more complex and dynamic, the need for entrepreneurial proficiency is increasingly emphasized, especially in developing economies such as Nigeria, where entrepreneurship is seen as a critical vehicle for job creation and economic growth (Adeleke & Makinde, 2021). This in no doubt calls for retooling in order to attain a level of development.

Retooling adult education for entrepreneurial proficiency in Nigeria is a powerful towards achieving national development. By equipping adults with entrepreneurial skills, Nigeria can create a more resilient workforce capable of innovating, adapting, and contributing to economic growth. The paper identified lack of entrepreneurial focus in curricula, inadequate infrastructure and resources, insufficient qualified educators and low participation and motivation as major challenges affecting entrepreneurial proficiency in Nigeria. .

Recommendations

The paper however put forward some recommendation that must be put in place so as to ensure entrepreneurial proficiency through adult education in Nigeria:

There is need for curriculum overhauling in adult educational system. Adult education curricula need to incorporate entrepreneurship modules that include financial literacy, innovation, and business development. This was supported by Obanya (2011): he noted that

entrepreneurship education should focus on both theoretical and practical aspects of running a business. Through this, adult learners can have a grasp of the reality when it comes to business.

There is need to inculcate the application of modern technologies. Technology can be an effective tool in reaching adult learners, especially in rural areas. E-learning platforms and mobile applications can provide access to entrepreneurial courses, financial management tools, and mentorship opportunities (Okoye & Ofoegbu, 2018). This will make learning more convenient for adult learners.

Training and recruitment of more qualified staff is a necessity in educational centres. This will enable the trainers to broaden their horizon in the areas of effective delivery services. Business incubators and mentorship programmes should be inculcated in training as this will provide adult learners with real-world experience.

The need for adequate funding and policy support cannot be overemphasized. Government and private sector support is crucial in funding adult education programmes tailored toward entrepreneurship. The Nigerian government should develop policies that encourage entrepreneurship education at all levels, including adult learning (Federal Ministry of Education, 2020).

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Effects of Drill and Practice and Conventional Method on Hausa Language Students' Performance and Retention in Daura Educational Zone, Katsina State, Nigeria

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Abstract

The study investigates the Effects of Drill and Practice and conventional methods on Hausa language students' academic performance and retention in Daura Educational Zone, Katsina State, Nigeria. The study stated that two research objectives, research questions, and hypotheses were formulated. The study used a quasi-experimental research design of pre-test, post-test, non-equivalent, non-randomize control group design. The population of the study was 3,912 SSII Hausa language students in Daura Educational Zone, Katsina State. 101 SS II Hausa language students used purposive sampling to participate in the study. The study used the Hausa Language Achievement Test for data collection. The Hausa language Achievement Test was made up of 40 multiple-choice questions. The instrument was adapted from past questions in the West Africa Examination Council (WAEC). Experts validated the instrument. The reliability of the instruments was established using a test-retest method and a reliability coefficient of 0.669 was obtained. The experimental group was taught using the Drill and practice method while a control group was taught using the conventional method of teaching. The study research questions were answered using mean and standard deviation while the formulated hypotheses were tested using an independent sample t-test. This study findings show a significant difference in the academic performance of senior secondary school students taught the Hausa Language using drill and practice and those taught using the conventional method in favour of the drill and practice method. The study revealed that there was a significant difference between the retention score of students taught the Hausa language using Drill and Practice and those taught using the conventional method in favour of drill and practice group. Also, there was a significant difference in the academic performance of male and female students taught the Hausa language using drill and practice methods. Based on the findings of this study, the study concluded that the drill and practice method can improve students' academic performance and retention in the Hausa language. But it was more favourable to male students. Thus, based on the findings of this study, it was recommended that the Hausa language teachers should use the Drill and practice method to stimulate and boost Hausa language students' academic performance and retention at the senior secondary school level.

Keywords: Computer Assisted Instruction (CAI), Drill and Practice, Conventional Method

Introduction

The Hausa language is one of the most widely spoken languages in Nigeria, primarily in the northern region. It is a Chadic language and serves as a lingua franca not only among the Hausa people but also for various ethnic groups in northern Nigeria and neighbouring countries (Niger, Cameroon, Benin just to mention a few). The Hausa language is among the three major languages in Nigeria. The Hausa language is one of the subjects being taught in a formal school system in Nigeria (Federal Republic of Nigeria, 2014). Hausa language is widely spoken in the North-west, North-central and North-east parts of Nigeria. Some Northern parts of Nigeria adopted the Hausa language as a medium of instruction in schools. For instance; it was adopted as one of the mediums of instruction since the establishment of government schools in Kano. The Hausa language does not only serve as a medium of instruction but a subject of study both nationally and internationally. Degrees and certificates are awarded to deserving students by universities and colleges of education.

Computer Assisted Instruction (CAI) is a means of teaching that helps students experience real simulations that cannot be seen in conventional circumstances (Adebisi et al, 2014; Hussain, 2011). Denby and Holman (2006) reported that students show more engagement, and interest and exhibit a longer attention span when utilizing computers. They further stated that learners can be able to visualize and manipulate complex models, three-dimensional images and movements to enhance understanding and retention of complex language concepts and ideas. Yusuf and Afolabi (2010) In Language studies, a computer can present words to be spelt, sounds to be made, and instructions to be followed. The computer can be used to evaluate students' performance and direct students to the previous lesson pause and move to the next lesson for appropriate learning activities (Bada, 2009). However, different modes of CAI can be integrated into the teaching and learning of the Hausa language. One of these modes is computer-based Drill and practice.

Drill and practice involve a sequence of tasks, exercises, or words repeated again and again until they can be performed without error. In a CAI drill and practice design, the computer screen presents the student with questions to respond to or problems to solve and the student responds. The computer therefore informs the student whether the answer is correct and if the student is right, he or she is

given another problem to solve, but if the student responds with a wrong answer, the computer corrects him or her (Mudasiru and Adedeji 2010). Computers can produce drills of much greater effectiveness than workbooks. Drills and practice are not intended to teach. Drills and practice can be combined with conventional methods as a way of reinforcing what has been learnt in the classroom. This study, therefore, is interested in the effects of drill and practice and conventional methods on Hausa language students' performance and retention in Daura Educational Zone Katsina State, Nigeria.

Statement of the Problem

The teaching and learning outcomes of students depend on the kind of methods employed by the teachers during their lesson delivery. Traditional teaching methods such as the chalk-talk method, lecture method, and demonstration method amongst other methods adopted by the Hausa language teachers in senior secondary schools are often referred to as conventional teaching methods. And, this method is more emphasized on teacher-centered rather than students-centered. This teaching strategy often discourages creativity and disengages students from thinking and reasoning beyond what is presented to them by their teachers. Moreover, poor application of effective teaching methodologies by the teachers is the major issue that may lead to low performance and retention in senior secondary schools. A conventional method of teaching does not favour good student performance and retention. Hence, conventional teaching methods used by the teachers may be responsible for the poor performance and retention of Hausa language students in senior secondary schools. Therefore, to overcome these problems, there is much need to determine the effects of Drill and Practice as an alternative to teaching and learning of Hausa language in senior secondary schools for the improvement of the senior secondary schools' Hausa language students' performance and retention in Daura Educational Zone Katsina State, Nigeria.

In Nigeria, most teachers teach with the traditional (chalk-talk) method otherwise known as the lecture method of teaching which renders students' passive listeners and makes teaching ineffective and as such affect's students' academic performance negatively, especially in the Hausa language. Azikwe (2008) lamented that among the very serious problems of teaching the Hausa language are poor teaching methods, problems of inadequate teaching facilities, poor or lack of motivation, the problem of inadequate and unqualified teachers or

staff, lack of knowledge to operate and apply ICT facilities in teaching and learning, the Hausa language among others. This study thus, this study investigated the effects of Drill and Practice and conventional on Senior Secondary School Hausa Language students' performance and retention in the Daura educational zone, Katsina State, Nigeria. It also determined the influence of gender on the achievement of students taught using the two independent variables.

Objective of the Study

The objectives of the study are to:

1. Ascertain the difference between the mean retention scores of students taught the Hausa language using the Drill and Practice method and those taught with the conventional method in Daura Educational Zone, Katsina State.

2. Establish the difference in the mean academic performance scores of male and female students taught the Hausa language using the Drill and Practice method in Daura Educational Zone, Katsina State.

Research Question

1. What is the difference between the mean retention scores of students taught the Hausa language using the Drill and Practice method and those taught with the conventional method in Daura Educational Zone, Katsina State?

1. What is the difference in the mean academic performance scores of male and female students taught the Hausa language using the Drill and Practice method in Daura Educational Zone, Katsina State?

Hypothesis

H_{01}. There is no significant difference between the mean retention scores of students taught the Hausa language using the Drill and Practice method and those taught with the conventional method in Daura Educational Zone, Katsina State

H_{02}. There is no significant difference in the mean academic performance scores of male and female students taught the Hausa language using the Drill and Practice method in Daura Educational Zone, Katsina State.

Methodology

The study adopted a Quasi-experimental design. Specifically, the study used a non-equivalent, non-randomized, pretest, posttest control group design. The choice of this design was due to the nature of the participants who cannot be studied individually(generalization), the impossibility of randomizing the subject (intact class of Hausa Language students) and the need to establish the effect of the treatment on students' learning outcome (comparing students that received treatment with those that did not receive the treatment). When a quasi-experimental study falls under the aforementioned conditions, White and Sabarwal (2014) recommended the design used in this study.

The population for this study comprised all Senior Secondary School II Students (SS II) offering the Hausa Language in Daura Educational Zone, Katsina State. There are 3,912 SS2 students in the public Senior Secondary Schools at Daura Educational Zone for the 2018/2019 Academic Session (Office of the Director, Daura Educational Zone of Katsina State). The sample size of this study was 101 SSII Hausa language Students. Two schools were sampled purposively based on having computer facilities that can serve an intact class, located far from each other, coeducation schools. School "A" has an intact class of 54 SSII-A Hausa Language Students while school "B" has having intact class of 47 SS II –A Hausa Language students. The schools were assigned into experimental and control groups. The instrument used for data collection was the Hausa Language Achievement Test (HAULAT), which was administered in three stages (pre-test, post-test and retention test). At each stage, items of the instrument were reshuffled and the answers to the questions were reassigned to other options. HAULAT is of two sections (A and B). Section "A" elicited information on respondent's bio-data while section "B" contains 40 items of multiple-choice objective questions. Each question contains five options A to E. It was adapted from the National Examination Council (NECO) and West African Examination Council past question papers (1999-2018). The questions covered the taught topics: Places of articulation (GabobinFuruci), Translation (Fassara), Morphology and Comprehension. Two marks were awarded for the correct answer while zero was allocated to each wrong answer.

The instrument was validated by Senior Lecturers, not below a senior rank the reliability of HAULAT, the pilot test was carried out using 30 students from Government Pilot Secondary School (G.P.S.S. Zango). The study used a test-retest approach. Reliability coefficient level of the instrument (HAULAT) used for the study; data collected was subjected to statistical analysis. Hence, the reliability coefficient was determined using Pearson Product Moment Correlation Coefficients (PPMCC) which yielded the reliability coefficient value of 0.669. Hence, this result shows that the instrument is reliable because the closer the result is to one (1) the more reliable the instrument becomes. In this study, data was collected using the Hausa Language Achievement Test (HAULAT) which was administered as a pre-test, post-test and retention test. Initially, the pre-test was administered simultaneously to both the experimental and control groups before the treatment was administered. The purpose of this test is to measure the performance of the students constituting the sample. After the pretest, the experimental group was exposed to the computer Drill and practice mode of CAI, while the control group was exposed to the conventional method of teaching the same content used for the experimental group. After the treatment, the Hausa Language Achievement Test (HAULAT) was administered as a post-test immediately after the treatment. After four weeks, students in the experimental group and control group received a retention test. Pretest, posttest and retention test were marked according to the marking scheme and recorded.

Experimental Group: The Drill and Practice method was used here. The students in this group were taught the four selected Hausa language concepts using drill and practice packages. The computer here presented instructions interactively with each student in this group at a time. Some students in sets depend on the number of available computers for use, but they use the computers in an individualized sequence, and then proceed at their own pace, within a minimum of 45 minutes per lesson. Sets of questions were given to the students via the computer after the instruction and the students provided answers to the questions without any teacher's participation. The teacher's role here was to monitor the students' activities to ensure effective compliance with the instructions by the students.

Control Group: The conventional method of teaching was used here. The researcher here used the questions and answers method and presented lessons on the same selected Hausa language concepts with the experimental group taught using the drill and practice method.

After the treatment, the items in the Hausa Language Achievement Test were reshuffled and re-administered to the students. The scores obtained from the second administration served as post-test scores in the study. The reason for the items reshuffle was to distract the students from realizing that they had responded to such test items in the past. Data was analyzed using descriptive and inferential statistics in responding to the study's research questions and testing of the research hypotheses respectively. Descriptive statistics of mean and standard deviation were used to answer the research questions while inferential statistics of ANCOVA were used in testing the research hypotheses to a 0.05 level of significance.

Results and discussion

Research Question One: What is the difference between the mean retention scores of students taught the Hausa language using the Drill and Practice method and those taught with the conventional method in Daura Educational Zone, Katsina State?

In answering research question two, the mean retention scores of students in control and experimental groups were analyzed using mean and standard deviation as shown in Table 1.

Table 1: The Mean and Standard Deviation of Pretest and Retention Scores ofontrol and Experimental Groups

	N	Mean	Pretest SD	Retention Mean	SD	Mean Gain
Control	54	22.39	4.081	69.56	5.354	47.17
Experimental	47	28.38	2.960	75.40	4.586	47.02

Table 1 shows the mean and standard deviation of the pretest and retention academic performance scores of the control and experimental groups. From the result, it can be seen that the mean score and the standard deviation of the pretest and retention scores of the control group are X= 22.39, SD= 5.354 and X= 69.56, SD= 5.354 respectively. The mean gain is 47.17 in favour of the control group achievement score. Similarly, the mean and standard deviation of the pretest and retention scores of the experimental group are X=28. 38, SD= 2.960 and X= 75.40, SD= 4.586 respectively. The mean gain is 47.02 in favour of the experimental group achievement score. Also, the result reveals the mean difference of 0.15 pretest and retention mean gain of control and experimental groups.

To further attest to this, the mean gain scores between the pretest and retention of the two groups are shown in Figure 1.
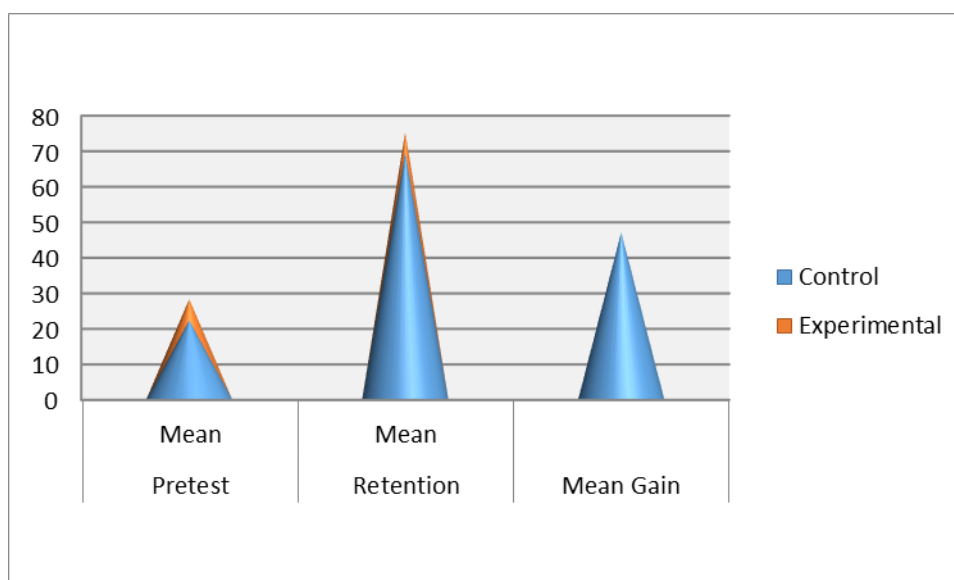
Figure 1: Graphical Representation of pretest and retention of experimental and control Groups

Research Question Two: What is the difference in the mean academic performance scores of male and female students taught the Hausa language using the Drill and Practice method in Daura Educational Zone, Katsina State?

In answering research question three, the mean academic performance scores of male and female students in experimental groups were analyzed using mean and standard deviation as shown in Table 2.

Table 2: The Mean and Standard Deviation of Pretest and Posttest Scores of male and Female Students in Experimental Groups

Gender	N	Pretest		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Male	20	25.72	3.837	77.13	4.281	51.41
Female	27	24.70	5.294	74.56	6.123	49.86

Table 2, shows the mean and standard deviation of the pretest and posttest academic performance scores of male and female students in experimental groups. From the result, it can be seen that the pretest mean score of male students was 25.72 with a standard deviation of 3.837 while the pretest mean score of male students was 24.70 with a standard deviation of 5.294. The posttest mean score of male students was 77.13 with a standard deviation of 4.281 while the posttest mean score of female students was 74.56 with a standard deviation of 6.123. The mean gain of male students was 5.41 while that of female students was 49.86. This shows that the male students' mean score is better than the female students' mean score. The standard deviation of pretest and posttest scores are x= 24.70, SD= 5.294 and X= 74.56,

SD= 6.123 respectively. The mean gain is 49.86 in favour of the control group achievement score. Similarly, the mean and standard deviation of the pretest and post-test academic performance scores of the experimental group are X= 25. 72, SD= 3.837 and X= 77.13, SD= 4.281 respectively. The mean gain is 51.41 in favour of the experimental group achievement score. Also, the result reveals the mean difference of 1.55 pretest and posttest mean gain of control and experimental groups.

To further attest to this, the mean gain scores between the pretest and posttest of the two groups are shown in Table 2 and Figure 2.
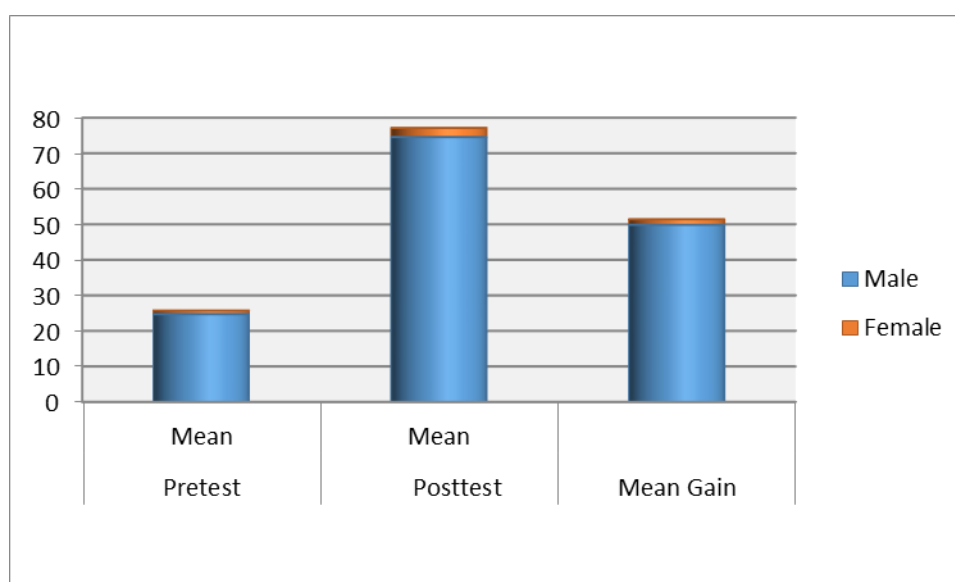
Figure 2: Graphical Representation of Pretest and Posttest of Experimental and Control Groups

H_{O1}: There is no significant difference between the mean retention scores of students taught the Hausa language using the Drill and Practice method and those taught with the conventional method in Daura Educational Zone, Katsina State

To test this hypothesis, the retention scores of both the experimental and control groups were compared using Analysis of Covariance (ANCOVA). The results are presented in Table 3.

Table 3: ANCOVA of Retention Mean Scores of Control and Experimental Groups

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1097.444[a]	2	548.722	23.913	.000
Intercept	7415.178	1	7415.178	323.145	.000
Pretest	237.859	1	237.859	10.366	.002
Retention	157.937	1	157.937	6.883	.010
Error	2248.794	98	22.947		
Total	**530970.000**	**101**			

Corrected Total	3346.238	100

a. R Squared = .328 (Adjusted R Squared = .314)

Table 3, presents the result of hypothesis two. The hypothesis was tested using the retention mean scores of both groups while the pretest served as a covariate for the Analysis of Covariance. The F-value of 323.145 was significant at 0.05 alpha level, that is. F (1, 98) = 323.145, P< 0.05. The result shows that there was a significant difference between the retention performances of the experimental group taught the Hausa language using the Drill and Practice method and the control group taught the Hausa language using the conventional method in favour of the experimental group. On this basis, hypothesis two was rejected. This shows that the performance of the experimental group taught using the Drill and Practice method was significantly different from that of a control group that taught using the conventional method.

H$_{O2}$: There is no significant difference in the mean academic performance scores of male and female students taught the Hausa language using the Drill and Practice method in Daura Educational Zone, Katsina State.

To test this hypothesis, the post-test scores of both male and female students in the experimental group were compared using Analysis of Covariance (ANCOVA). The results are presented in Table 4.

Table 4: ANCOVA Result Posttest Mean Scores of Male and Female Students taught Hausa language using Drill and Practice method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	910.334[a]	2	455.167	21.379	.000
Intercept	12264.998	1	12264.998	576.076	.000
Pretest	744.089	1	744.089	34.949	.000
Posttest	96.748	1	96.748	4.544	.036
Error	2086.478	98	21.291		
Total	582579.000	101			
Corrected Total	**2996.812**	**100**			

a. R Squared = .304 (Adjusted R Squared = .290)

Table 4 shows the comparison of post-test mean scores of male and female students taught the Hausa language using Drill and Practice. With F (1, 34.949) = 0. 0.36, P>0.05. This shows that there was a significant difference between the mean scores of male and female students taught the Hausa Language using drill and practice methods in favor of male students. On this basis, hypothesis three is rejected.

This shows that the performance of male students in the experimental group was significantly different from that of female students.

Discussion

The research question raised by the study is to establish whether there will be a difference in the retention score of students taught the Hausa Language using the drill and practice method and those taught using the conventional method. The corresponding hypothesis also sought to know whether the observed difference would be statistically significant. The result shows that there was a difference in the retention score of SSII students taught the Hausa Language using the drill and practice method and those taught using the conventional method in favour of the drill and practice method. The corresponding hypothesis revealed that the observed difference between the two groups was statistically significant. This implies that students taught using the drill and practice method retained learnt contents of the Hausa Language more than those taught using the conventional method This finding is in line with the findings of Achor, Ator and Umoru (2013); Bichi (2010) reported that drill and practice improved students' retention ability than conventional methods. However, the finding of the study differed from the findings of Kareem, (2015) who found no significant in the retention ability of students taught using drill and practice and those taught using conventional methods. This contradiction, however, could be because of the difference in the topics taught. The various literature reviewed so far revealed that computer-assisted learning strategies have added a profound development to teaching and learning processes. However, that does not mean that the research will ascertain the effectiveness of the Drill and Practice learning strategy on the academic performance and retention of Hausa students in the Daura educational zone, Katsina State, Nigeria.

Seo and Bryant, (2009) stated that computer-assisted instruction allows for interaction and immediate feedback as well as increasing the motivation and interest of students. Also, Chang (2006) reported a significant increase in the performance of students when CAI was used to teach. However, some researchers are of the view that computer-assisted instruction should only supplement conventional instruction environments. In meta-analytic study conducted by Christman and Badgett (2006) discovered that students who received instruction supplemented by CAI attained higher academic performance than those who received only conventional instruction.

To summarize the proceeding discourse, it will be concluded that the studies on computer-assisted instruction reveal significant research works made by different personalities and also the number of contributions they gave to knowledge. It has also helped the current researcher to see his studies from the historical perspective concerning earlier critics made on similar issues relating to computer-assisted instruction thereby providing new ideas and approaches to arriving at logical solutions.

Drill and practice instructional strategies have been reported to be very effective in language learning and other science subjects. Hoverer, most of the previous studies that used drill and practice for language learning used L2 rather than L1. Therefore, the present study used the drill and practice method on L1. There is scanty literature on whether the positive effect associated with drill and practice instructional method would be repeated when used in teaching local Language.

Conclusion

The study investigated the effects of Drill and Practice on senior Secondary school Hausa language Students' performance and retention. From the findings of this study, it was concluded that the use of Drill and Practice enhanced students' performance and retention of taught concepts of the Hausa language. Furthermore, the study concluded that drill and practice are more beneficial to male Hausa language students than to female Hausa language students.

Recommendations

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

1. Hausa language teachers also be encouraged to integrate computer-based drills and practice into the teaching of Hausa language to improve students' retention of Hausa language taught concepts.

2. Governmental and non-governmental agencies such as NITDA and NCC among others should provide the needed facilities for the effective integration of computer-based Drill and Practice methods in Hausa language teaching and learning activities.

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Counselling Approaches for Skills Acquisition among Adolescents in 21st Century

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Abstract

The purpose of this study was to investigate the most effective counselling approaches for developing skills among adolescents in Nigeria. A mixed-methods of qualitative and quantitative research design was utilised for this study, with data collected through surveys and interviews with adolescents and counsellors. The sample for the study comprises of 40 respondents, of whom 30 are adolescents and 10 are counsellors across the nation. Results showed that integrative counselling, which combines elements from various approaches, was most effective in promoting skill acquisition among adolescents. Additionally, a collaborative approach where the counsellor and adolescent work together to set goals and develop strategies was found to be crucial to the success of counselling for skill development. These findings have implications for counselling practices and interventions aimed at promoting skill development among adolescents. This study provides valuable insights for counsellors, educators, and policymakers to better understand and support the unique needs of adolescents in their skill acquisition journey.

Keywords: Adolescent Development, Skill Acquisition, Counselling Approaches, Intervention

Introduction

Adolescence is a pivotal developmental stage characterised by rapid physical, cognitive, and psychosocial changes (Yurgelun-Todd, 2017). During this period, adolescents grapple with identity formation, peer relationships, and academic pressures, necessitating the development of essential life skills to navigate these challenges successfully. As a crucial period of development, adolescence builds the foundation of how a person will become. Skill acquisition is crucial for adolescents' overall well-being, academic achievement, and future success (Liu, 2023). Adolescence is a period characterised by rapid growth, exploration, and the development of independence. During this phase, adolescents encounter a myriad of challenges that can hinder their ability to acquire essential life skills (Mutahi et al, 2024). These challenges may include academic pressures, peer pressure, family conflicts, and identity crises.

Adolescence, a transitional period marked by significant physical, psychological, and social changes, is a critical stage in human development. During this period, adolescents grapple with identity formation, peer relationships, academic pressures, and the transition into adulthood. The acquisition of essential life skills is paramount for navigating these challenges successfully and for future well-being (Benson et al, 2016). Counselling, as a professional relationship focused on personal growth and development, has emerged as a vital intervention to support adolescents in their skill acquisition journey (American Counselling Association, 2014). The ability to effectively counsel adolescents for skill development is crucial for addressing the multifaceted challenges they encounter. Skills such as problem-solving, decision-making, communication, and interpersonal relationships are essential for adolescents to thrive in various life domains, including education, career, and personal life (Ramala & Madhumathi, 2023). However, the efficacy of different counselling approaches in promoting skill acquisition among adolescents remains a subject of ongoing exploration.

The acquisition of skills such as problem-solving, decision-making, communication, and interpersonal relationships is crucial for adolescents to navigate these challenges successfully and to build a foundation for future success (Glanz, et al., 2019). Counselling, as a professional relationship focused on enhancing individuals' emotional, cognitive, and behavioural functioning (Syed, 2017), offers a promising avenue for facilitating skill development among this population. The role of counselling in promoting skill acquisition among adolescents has garnered increasing attention in recent years (Rathi et al, 2022). Conducted research to highlight, the effectiveness of counselling interventions in addressing various adolescent concerns, such as academic difficulties, social problems, and emotional regulation (Benson et al, 2016). However, a comprehensive understanding of the specific counselling approaches that optimize skill development remains an area of ongoing inquiry.

Effective Counselling Approaches for Skill Development in Adolescents

According to O'Brien et al, (2023). The adolescence period is a crucial time for personal growth and skill development. Therapists can utilize various approaches to equip adolescents with the tools they need to navigate challenges and thrive (Yadav, 2023). Here are some effective counselling approaches that need to be considered for effective

adolescent personal growth and skills development for self-sustainability (Harvey et al, 2023). Below are as follows

    i.   Cognitive-Behavioural Therapy (CBT) theory developed by Aaron Beck 1960

    ii.   Solution-Focused Therapy (SFT) theory developed by Shazer and Kim Berg 1970s

    iii.   Dialectical Behaviour Therapy (DBT) theory developed by Marsha Linehan 1970s

    iv.   Acceptance and Commitment Therapy (ACT) theory developed by Steven C. Hayes 1980s

    v.   Motivational Interviewing (MI) theory developed by Rollnick and Miller 1995

    vi.   Family Systems Therapy (FST) theory developed by Murray Bowen 1950s

    vii.   Art Therapy (AT) theory developed by Adrian Hill 1942

    viii.   Peer Group Therapy (PGT) theory developed by Joseph Hersey Pratt 1905

The CBT helps adolescents identify negative thought patterns that contribute to emotional and behavioural difficulties. Through CBT techniques like cognitive restructuring and behavioural activation, adolescents can learn to challenge unhelpful thinking and develop coping skills to manage stress and emotions effectively (Beck, 2011). On the other hand, the SFT focuses on identifying adolescents' strengths and past successes. The therapist works collaboratively with the adolescent to establish achievable goals and develop solutions for overcoming challenges (Walter & Pellerin, 2011). However, the DBT equips adolescents with skills for managing intense emotions, improving interpersonal relationships, tolerating distress, and regulating their behaviour. It is particularly helpful for adolescents struggling with emotional dysregulation or self-harm (Linehan, 2014). The ACT promotes psychological flexibility by helping adolescents accept difficult thoughts and feelings while taking committed action towards their values. ACT techniques like mindfulness and diffusion help adolescents detach from unhelpful thoughts and live a more fulfilling life (Hayes, 2004). In addition, the MI uses a collaborative, client-centred approach to explore an adolescent's ambivalence about change. The therapist helps the adolescent identify their own reasons for change and develop a plan for moving forward (Miller & Rollnick, 2012).

In another related development, the Family therapy can be a powerful tool for addressing adolescent behaviour issues and improving family communication. The therapist works with the entire family system to identify unhealthy patterns and develop more effective communication and problem-solving skills (Goldenberg & Goldenberg, 2008). However, the Art therapy provides a safe space for adolescents to express themselves creatively and explore their emotions in a non-verbal way. This can be particularly helpful for adolescents who struggle with verbal communication (Wolkoff, 2014). Adolescents at the stage of development usually tend to be guided by the Peer group therapy allows adolescents to connect with others facing similar challenges. This can provide a sense of validation, belonging, and support, as well as opportunities to learn new skills from peers (Corey, 2017).

This study explores the counselling approaches employed in fostering skill acquisition among adolescents. The study will look for effective counselling approaches through a critical analysis of the existing literature and empirical evidence on how such approaches work among adolescents. The approaches that will add to the development of evidence-based counselling practices that meet the particular needs of adolescent clients will be useful (Dadds et al, 2021). Skill development encompasses problem-solving, decision-making, communication, inter-relating, and emotional intelligence, among others (Ramala & Madhumathi, 2023). Such skills are necessary in the building of resilience among adolescents to enable them to enter into healthy relationships and achieve goals both at personal and academic levels. Kazdin, (2019) agreed that such skills can be developed through appropriate counselling intervention which can enable adolescents to acquire such skills and use them appropriately in different life domains. While cognitive-behavioural, solution-focused brief, and person-centred therapies have been employed (Dameron, 2016), comparative research on their effectiveness in skill development remains limited. Thus, This systematic review, therefore, aims to identify the promising practices in counselling and factors that influence outcome variability, which in turn will inform the construction of evidence-based interventions enabling the counsellors to make appropriate choices for adolescent clients and contribute to the development of skill-building programs enhancing adolescent well-being and potential.

In the study conducted by Aluede and Ikechukwu, (2021) titled: School Counsellor's Roles in Minimising Adolescents' Attrition from Schools highlight the critical issue of adolescent school dropout rates

in Nigeria, emphasizing the need for effective interventions. It identified key factors contributing to dropout, including financial constraints, personal characteristics, societal pressures, and home environment. Given the complex nature of these factors, the study posits the school counsellor as a pivotal figure in minimizing dropout rates. By offering financial advice, emotional support, and career guidance, counsellors can address various student needs. Furthermore, collaboration with parents, communities, and other professionals is essential for creating a comprehensive support system. The study emphasizes the importance of value orientation, career education, and early intervention programs to foster resilience and academic persistence among adolescents. Chinwe's (2022) study examined the relationship between skill acquisition and entrepreneurship education in Anambra State's public universities. The research focused on how technical innovation, creativity, and opportunity recognition impact graduate skills. Employing a quantitative approach with 218 student respondents, the study found a positive correlation between financial and business skills with entrepreneurial education programs. However, marketing skills showed no significant impact. The research concluded that enhancing skill acquisition through intensified training can boost entrepreneurial ventures and recommended collaborative efforts to improve entrepreneurship education in tertiary institutions.

In the study carried out by Smith et al., (2023) titled Effectiveness of Different Counselling Approaches for Promoting Resilience in Adolescents. The study examines how different counselling approaches like CBT and ACT can equip adolescents with skills to navigate challenges and build resilience. It suggests a connection between skill development and increased resilience in adolescents. However, Jones et al. (2022) carried out a study on Technology-Assisted Cognitive Behavioural Therapy for Anxiety in Adolescents: A Systematic Review and Meta-analysis. The study focuses on a specific CBT approach delivered through technology. It analyse research on the effectiveness of technology-assisted CBT in reducing anxiety among adolescents. And found that CBT pays and important role in reducing the anxiety among adolescents and that have greatly help them to develop skills and careers in their day-to-day activities.

In another related development Brown et al. (2021) carried out a similar study titled the Role of Group Therapy in Promoting Social and Emotional Learning (SEL) in Adolescents. It further explores group therapy as a method for enhancing social and emotional skills in

adolescents. The study highlights the positive impact of group dynamics on developing critical SEL skills. However, Lee et al. (2020) posits in their study titled Culturally Responsive Counselling Approaches for Skill Development with Diverse Adolescent Populations that the importance of cultural considerations in counselling. Have been addressed. They examined culturally responsive approaches that cater to the unique needs and backgrounds of diverse adolescent populations. in addition to the aforementioned Miller et al. (2019) in their study titled the Long-Term Effects of School-Based Social Skills Training Programs for Adolescents: A Meta-Analysis, investigates the long-term effectiveness of social skills training programs implemented in schools. Their findings suggest these programs have lasting positive effects on adolescent social skills development.

Problem Statement

The study highlights the critical need for effective counselling approaches to facilitate skill acquisition among adolescents. Despite the pivotal role of skills in shaping adolescents' future, many young people struggle to develop essential competencies. It is important to note that this study is to identified an urgent need for the identification of appropriate counselling approaches to enhance skill acquisition among adolescents. Insofar as skills are significant in enhancing the future success of adolescents, many youths do have difficulties in developing these necessary competencies. In Nigerian context presents unique challenges and opportunities for adolescent skill development. Factors such as cultural norms, socioeconomic disparities, and limited access to quality counselling services may influence the effectiveness of counselling approaches. Therefore, there is a need to explore the applicability and adaptation of counselling strategies to the specific needs of adolescents in Nigeria, by addressing this research gap, this study seeks to contribute to the development of evidence-based counselling practices for promoting skill acquisition among adolescents in Nigeria. The findings of this study will inform the development of targeted counselling interventions, enhance the training of counsellors, and ultimately improve the overall well-being and future prospects of Nigerian adolescents.

Furthermore, this study will identify the gap in understanding how different counselling approaches can be used to enable the acquisition of necessary skills among adolescents, leading to personal, academic, and vocational success. The study therefore seeks to identify appropriate interventions that could help in the effective development

of skills, facilitating self-efficacy and, essentially, preparing adolescents for the challenges and opportunities that face them during adulthood. While the development of skills is an area of concern, the study will explicitly targeted to those specific approaches in guidance and counselling which work best in facilitating skill acquisition in adolescents within Nigeria. While counselling has been generally recognized as one of the most valuable interventions in adolescent development, the best counselling strategies that enhance the acquisition of skills.

Research Objectives

The main objective of this study is to determine Counselling Approaches for Skills Acquisition among Adolescents and the specific objectives are to:

1. Compare the effectiveness of difference counselling approaches for promoting skill development among adolescents.
2. Examine the role of a collaborative approach in counselling for adolescent skill development.
3. Explore the perceived effectiveness of integrative counselling for adolescent skill development among counsellors in Nigeria.

Research Questions

1. Is there any difference in counselling approach used (e.g., CBT, DBT, and Family Therapy) for promoting skill development among adolescents?
2. Is there any role of collaborative counselling approach, where the counsellor and adolescent work together to set goals and develop strategies, contribute to greater skill development in adolescents compared to a more traditional, directive approach?
3. To what extent do counsellors in Nigeria perceive integrative counselling (combining elements from various approaches) as an effective approach for developing skills among adolescents?

Null Hypotheses

H_{O1}: There is no significant relationship in counselling approaches for promoting skill development among adolescents in Nigeria.

Methodology

The study adopted a mixed-methods, quantitative and qualitative survey research design. Sampling in quantitative and qualitative

research is a critical component that involves selecting a representative subset of individuals or cases from a larger population and employing sampling techniques based on probability theory (Hossan et al, 2023). Convenience Sampling is a non-probabilistic technique of data collection where subjects are selected from the population based on their accessibility and availability of data (Victor et al, 2024). Its simplicity and speed make it a commonly used method in various research fields. The researcher can quickly gather large volumes of data without spending significant time or resources. However, convenience sampling is applicable in both qualitative and quantitative research methodologies (Victor et al, 2024). Then, the samples consisted of 40 participants, 30 adolescents and 10 counsellors, all from the north-west states of Nigeria. Data were collected from the adolescents through questionnaires. In-depth interviews were conducted with the counsellors to gain their perspectives on the issues relevant to the study. A 16-item, 4-point Likert scale was developed by the researchers. The scale's face and content validity were established by experts in guidance and counselling at the university level. The researcher-designed instruments used for data collection were the Counselling Approaches for Skills Acquisition Questionnaire (CASAQ) and the Counsellors Opinion Interview Questions (COIQ). Both the instruments underwent pilot testing with 10 adolescents and 3 counsellors from the study area, but outside the final sample. Data obtained from the pilot test and member checking were analysed using Cronbach's and Krippendorff's alpha, resulting in reliability index of 0.76 and 0.79 for the CASAQ and COIQ instruments, respectively. These coefficients indicate good internal consistency. Purposive sampling techniques were employed to select the participants. Descriptive statistics (mean and standard deviation) were used to answer the research questions. Pearson product moment correlation coefficients (PPMC) were used to test the null hypothesis.

Results

Answering Research Question 1: Is there any difference in counselling approaches used (e.g., CBT, DBT, and Family Therapy) for promoting skill development among adolescents?

Table 1. Shows the descriptive statistics on the impact of counselling approaches on the level of skill development among adolescents.

S/N	Statement	N	Mean	SD	Decision
1	Compared to other approaches, I believe Cognitive Behavioural Therapy (CBT) is significantly more effective in helping adolescents develop new skills.	40	3.58	.844	Accepted

2	I have observed adolescents acquiring new skills more readily through Dialectical Behaviour Therapy (DBT) compared to other counselling approaches.	40	3.45 .876	Accepted
3	In my experience, Family Therapy is less effective than individual counselling approaches for promoting skill development in adolescents.	40	3.13 1.017	Accepted
4	When working with adolescents, I find that Art Therapy is not as helpful as other approaches for developing practical skills.	40	2.90 1.008	Accepted
	Grand Mean		**3.27**	

Source: Fieldwork, 2024

Analysing the data in Table 1 with a decision mean of 2.50, counsellors generally believe the type of counselling approach used significantly impacts adolescent skill development (Grand Mean = 3.27). Here the CBT (Mean = 3.58 indicated that counsellors and adolescents strongly agree (well above the decision mean) on CBT's effectiveness, with a low standard deviation indicating a high level of consensus. DBT (Mean = 3.45) and Family Therapy (Mean = 3.13) shows that counsellors and adolescents somewhat agree (above the decision mean) on the effectiveness of DBT and lean towards disagreeing with family therapy being ineffective (closer to agree than disagree). However, the standard deviation for both is higher than CBT, suggesting more variability in counsellor responses for these approaches. Art Therapy (Mean = 2.90) indicates that counsellors and adolescents generally disagree (slightly nearly the decision mean) with art therapy being unhelpful. However, the standard deviation suggests some counsellors hold this view. Overall, these findings suggest counsellors recognize the value of specific approaches, particularly CBT, in promoting adolescent skill development. There's more consensus for DBT and some positive views on family therapy, but with more variation in opinions. Art therapy received mixed views.

Answering Research Question 2: Does a collaborative counselling approach, where the counsellor and adolescent work together to set goals and develop strategies, contribute to greater skill development in adolescents compared to a more traditional, directive approach?

Table 2: Shows the descriptive statistics on impact of collaborative counselling approach on skill development among adolescents compared to other traditional or directive approaches

S/N	Statement	N	Mean	SD	Decision
5	When adolescents actively participate in setting goals and developing strategies during counselling, they tend to show greater improvement in skill development	40	2.78	.920	Accepted
6	Counselling sessions where the counsellor directs the entire process are likely to be just as effective as collaborative sessions for promoting skill development in adolescents.	40	3.10	.709	Accepted

7	It is important for adolescents to feel a sense of ownership over their counselling goals to maximize skill development.	40	2.97	.832	Accepted
8	Adolescents are more likely to learn and retain new skills when they collaborate with the counsellor to develop personalized strategies.	40	2.85	1.10	Accepted
	Grand Mean		**2.93**		

Source: Fieldwork, 2024

Table 2 summarizes survey responses from counsellors and adolescents regarding the impact of a collaborative counselling approach on adolescent skill development compared to traditional approaches. The researchers use a decision mean of 2.5, with scores above indicating agreement and scores below indicating disagreement with the statement. The statement 5 (Mean = 2.78, SD = .920) shows that counsellors and adolescents somewhat agree (above decision mean) that adolescent participation in goal setting and strategy development leads to greater skill development. The standard deviation suggests some variability in counsellor opinions. Statement 6 (Mean = 3.10, SD = .709) indicates that counsellors and adolescents mostly agree (above decision mean) that counsellor-directed sessions can be as effective as collaborative sessions. The low standard deviation indicates a strong consensus on this point. Statement 7 (Mean = 2.97, SD = .832) posits that counsellors and adolescents somewhat agree (above decision mean) with the importance of adolescent ownership over goals for skill development. The standard deviation suggests some variability in opinions.

While on the other hand statement 8 (Mean = 2.85, SD = 1.10) shows that counsellors and adolescents somewhat agree (above decision mean) that collaboration on strategies leads to better skill learning and retention. The high standard deviation suggests a wider range of opinions on this topic. Grand Mean (Mean = 2.93): The grand mean slightly above the decision point suggests a general trend towards agreement with the positive impact of collaboration on skill development. The data suggests that counsellors see value in both collaborative and traditional approaches for promoting adolescent skill development. While collaboration on goals and strategies might be somewhat beneficial, counsellor-directed sessions remain a viable option. There seems to be some disagreement on the absolute necessity of collaboration, particularly regarding skill learning and retention. Further investigation might be needed to understand the specific contexts where each approach is most effective.

Answering Research Question 3: To what extent do counsellors in Nigeria perceive integrative counselling (combining elements from

various approaches) as an effective approach for developing skills among adolescents?

Table 3: Shows the descriptive statistics on extent counsellors in Nigeria perceived integrative counselling as an effective approach for developing skills among adolescents

S/N	Statement	N	Mean	SD	Decision
9	Compared to a single-approach counselling method, I believe integrative counselling that combines elements from different approaches is more effective for promoting skill development in adolescents	40	2.78	.974	Accepted
10	In my experience, adolescents who receive integrative counselling tend to show a wider range of skill development compared to those who receive a single-approach method.	40	2.93	1.07	Accepted
11	I would recommend using integrative counselling as the primary approach for most adolescents seeking to develop new skills.	40	3.40	.778	Accepted
12	There is not enough evidence to suggest that integrative counselling is significantly more effective than other approaches for adolescent skill development.	40	3.25	.870	Accepted
13	How comfortable are you using integrative counselling with adolescents in your practice?	40	2.30	.853	Rejected
14	To what extent do you believe additional training in integrative counselling would benefit your work with adolescents?	40	3.43	.813	Accepted
15	In your opinion, what are the biggest challenges of implementing integrative counselling in adolescent counselling practices?	40	3.03	.947	Accepted
16	In your experience, what are the potential benefits of using integrative counselling for adolescent skill development?	40	3.07	.829	Accepted
	Grand Mean		**3.02**		

Source: Fieldwork, 2024

Analysis in Table 3shows a (decision mean = 2.50), counsellors showed generally positive views towards integrative counselling for adolescent skill development (Grand Mean = 3.02). here the effectiveness and benefits of counselling approaches with (Mean > 2.50) indicated that Counsellors lean towards believing integrative counselling is somewhat more effective (Statements 9 & 10) and acknowledge its potential benefits (Statements 15 & 16). The standard deviations suggest some variability in these views. Strong Recommendation (Mean > 2.50) posits that despite the lack of definitive evidence (Statement 12, Mean = 3.25), counsellors seem to recommend it as the primary approach (Statement 11, Mean = 3.40). However, comfort level (Mean < 2.50) indicates that interestingly, counsellors report lower comfort using integrative counselling currently (Statement 13, Mean = 2.30). additionally, desire for Training (Mean > 2.50) which indicates that this suggests a willingness to bridge the comfort gap, with counsellors expressing a strong desire for further training in this approach (Statement 14, Mean = 3.43). Overall, while counsellors see potential in integrative

counselling, they also acknowledge the need for more evidence and their own skill development. This highlights a positive openness to this approach, but also a need for further support in its implementation.

Testing Null hypothesis

Table 4: Summary of hypothesis analysis on the significant relationship in counselling approaches for promoting skill development among adolescents in Nigeria

Variable				N	Mean	SD	r-Val	P-Val	Decision
Adolescents views on counselling approaches				30	3.05	0.66			
							0.704	0.000	Rejected
Counsellors views on counselling approaches				10	3.03	0.54			

Source: Fieldwork, 2024

Table 4 summarizes the analysis of a hypothesis regarding the relationship between adolescents' and counsellors' views on the impact of counselling approaches on adolescent skill development in Nigeria. The analysis uses a significance level of alpha (α) = 0.05. The p-value (0.000) is less than the significance level (α = 0.05). This indicates a statistically significant relationship between adolescents' and counsellors' views and R-values= 0.704 this indicated that there is strong relationship between the views of adolescents and counsellors on the impact of counselling approaches on adolescent skill development in Nigeria.

Discussion

This study indicates that both counsellors and adolescents show a strong consensus that the type of counselling approach used can significantly impact adolescent skill development. Counsellors strongly endorse CBT and view DBT favourably, with some variability in opinions. Family therapy received a more mixed response, with counsellors leaning towards agreement with its effectiveness. Art therapy showed some disagreement with its usefulness for practical skill development. Regarding collaborative counselling, counsellors and adolescents see value in both collaboration and the traditional approaches as preluding skill development among adolescents. While collaboration on goals and strategies might be somewhat beneficial, counsellor-directed sessions remain a viable option. There seems to be some disagreement on the necessity of collaboration, particularly for skill learning and retention. The study highlights a desire for further

training to bridge the gap between positive perception and practical implementation.

Although Table 4 doesn't show complete details (degrees of freedom), the p-value (0.000) suggests a statistically significant relationship between adolescents' and counsellors' views on the impact of counselling approaches. This aligns with the findings from previous studies (e.g., Aluede & Ikechukwu, 2021; Chinwe, 2022) that emphasise the importance of considering adolescent needs and perspectives in counselling interventions. The findings of Smith et al. (2023) and Jones et al. (2022) are in agreement with the findings of this study, which highlight the effectiveness of CBT approaches in promoting skill development and reducing anxiety in adolescents. Brown et al. (2021) emphasise the value of group therapy for social and emotional learning, while Lee et al. (2020) and Miller et al. (2019) address the importance of culturally responsive approaches and social skills training programmes, respectively. These findings suggest that a variety of approaches can be effective, and the optimal choice may depend on the specific needs of the adolescent. They are all in agreement with this study's findings.

Conclusion

The study concludes that adolescents and counsellors generally agree on the significant impact of counselling approaches on skill development. While counsellors favour CBT and DBT, with some variation in opinions, other approaches like family therapy and art therapy received mixed responses. Collaboration is seen as valuable, but counsellor-directed sessions remain a viable option. Interestingly, counsellors expressed a desire for further training to bridge the gap between their positive perception of integrative counselling and their current comfort level using it. Overall, the findings suggest that a variety of approaches can be effective, and the optimal choice depends on the adolescent's specific needs. This highlights the importance of considering both adolescent and counsellor perspectives when selecting counselling interventions to promote skill development.

Recommendations

The study recommends that governments, stakeholders and NGOs should:

1. Develop training programs in integrative counselling for counsellors working with adolescents in Nigeria. This will bridge the gap between its perceived benefits and practical use.
2. Promote tailored counselling approaches to meet individual adolescent needs. Counsellors should consider various approaches and collaborate with adolescents to find the most suitable method for skill development.
3. Encourage collaboration in counselling sessions. This can be fostered through training and practice, potentially benefiting adolescent skill development.

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Impact of Staff Development Programmes on the Principals' Performance in Administering Secondary Schools in North- West Zone, Nigeria

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Abstract

This study investigated the impact of staff development programmes on the principals' performance in administering secondary schools in North-West Zone Nigeria. For the purpose of the study, two objectives along with their corresponding research questions and hypotheses were formulated. Descriptive-survey design was employed for the study. The population of the study was 34,116 respondents comprising of 2,075 principals, 30,993 teachers and 1048 Ministry of Education officials. The sample size of the study was 378.The study used questionnaire for data collection whose validity and reliability indices were established at 0.84 and 0.91 respectively. Both descriptive and inferential statistics were used for data analysis. The findings among others revealed thatthere was no significant differences in the respondents' opinions with regards to principals' participation in conferences, (Cumulative Mean: 3.25 > 2.5) and (p. value 0.108 >0, 05 sig. level retained), and workshopsas they significantly helped them on effective ways of supervising their teachers in classrooms and this improves teacher performance in secondary schools in North-West zone Nigeria,(cumulative Mean: 3.33 > 2.5) (p. value 0.386 > 0,05 sig. level retained). It was Therefore, recommended that State Ministries of Education should allocate more funds and time to principals to enable them regularly participate in training and development programmes and efforts should also be made to encourage them attend both local and international conferences not only for the sake of promotion but for improvingtheir performance in the schools.

Keywords: Staff, Development, Programmes, Principal, Performance

Introduction

As instructional leaders, principals are responsible for the supervision, monitoring, assessment, evaluation and dissemination of current information on academic and modern teaching techniques to teachers leading to effective teaching and learning process as school

managers, principals are expected to effectively guide and control administrative process for achieving predetermined secondary education objectives as enshrined in the National Policy on Education (Ereh, Chigbata, & Ikpo, 2019).

Staff Development are activities which aim at improving updating maintaining employee's skills and abilities. It can also be seen as a set systematic or planned activities designed by an organization or a school to improved staff or principals of secondary schools with the opportunities to learn necessary skills to meet the current and future demand (Odden, Archibald, Fermanich and Gallagher, 2002), Staff development are series of activities put in place by an organization or a school in order to assist member of its staff acquire the knowledge, skills experience necessary for efficient and effectives performance job and responsibilities in the organization.

Staff Development programmes in education are measures designed to increase the knowledge, skill, experience, attitude and probably release employees latent potentials, so that their potential could be increased to meet the present and future job requirements, thus to meet its objectives. It enables principals to be efficient and effective in performance of their work (Ekpoh et al. 2013). The school principals need skills in group process facilitation, communication, conflict negotiation, and inquiry and data management. Hence, they need staff development to ensure they acquire these traits of good leadership.

Ekpoh et al. (2013) suggested staff development as a very important tool for improving the skills and performance of employees in an organization. As pointed out by Odden, et al., (2002), effective professional development produces changes in principals ' instructional practices which can be linked to improvements in both teachers and students' academic achievement. This therefore implies that staff development practices are effective motivational strategies for skill and knowledge acquisition for enhanced principals ' job performance. Principals require staff development to address specific roles and responsibilities in their jobs recognizes that principals are at the forefront of school leadership and as such strategic in school effectiveness. Principals must be developed as educators with much more Knowledge about the core technology of education. Basically, principals of public secondary Schools are employed and posted to schools by the State Ministry of Education.

Thus, we live in a fast-changing world because of science and smart technology and principals as educational leaders are faced with the

onerous task of managing resources and executing and administering policies and strategies in order to make schools more efficient and effective. However, there are some basic skills they needed to acquire to improve team work among staff who in turn would improve the academic performance of students to meet the goals of education. These skills include communication, instructional supervision, information and communication technology and disciplinary skills (Peretomode&Dinzei, 2019). Therefore, the main objective of the research is to explore the impact of staff' development programmes on the principals' performance in administering Secondary Schools in North-West Zone Nigeria.Specifically, the study seeks toassess the impact of principals' participation in conferences and workshop in the administration of secondary schools in North-West Zone, Nigeria.

Research Questions

The research sought to answer the following questions:

1. How does Conferences Participation by the Principals Impact on their Performance in administering Secondary Schools in North-West Zone, Nigeria?
2. In what ways does workshop Participation by the Principals Impact on their Performance in administering Secondary Schools in North-West Zone, Nigeria?

Research Hypotheses

The following null hypotheses were postulated for the study:

H_{O1}: There is no Significant Difference in the Opinions of MOE Officials, Principals and Teachers on impact of conferences on principals' Participation in conferences on their performance in administering Secondary Schools in North-West Zone, Nigeria;

H_{O2}: There is no Significant Difference in the Opinions of MOE Officials, Principals and Teachers on impact of workshops on principals' Participation in workshops on their performance in administering Secondary Schools in North-West Zone, Nigeria;

Conceptual Framework

Staff Development refers to skills and knowledge attained for both personal development and career advancement (Saleem, Masrur, & Afzal, 2014). Staff development encompasses all types of facilitated learning opportunities, ranging from college degrees to formal

coursework, conferences and informal learning opportunities situated in practice. It has been described as intensive and collaborative, ideally incorporating an evaluative stage (Kanwar, Balasubramanian, & Carr, 2019). There are a variety of approaches to staff development, including consultation, coaching, and communities of practice, lesson study, mentoring, reflective supervision and technical assistance Student achievement is linked to numerous factors (Amadi, 2013), but quality teachers are one of the most important components of student success. If school teachers do not have the tools they need to teach students effectively, their students will suffer (Kalina & Powell, 2009).

A Principal's job performance is one of the most important factors determining the quality of education in secondary schools (Munir & Khalil, 2016). The entire education system will be shaky if the performance of Principals is weak and ineffective. Therefore, effective job performance of Principals is imperative for any educational improvement. Performance of a Principals refers to how he/she undertakes the professional duties in the school at a given time. elaborated on the knowledge bases needed for effective teaching to include   content knowledge, pedagogical content knowledge of education ends, purposes and values, curriculum knowledge including materials and programmes, knowledge of learners and their characteristics, knowledge of educational contexts including characteristics of classrooms, schools, communities and cultures and general pedagogical knowledge including principles and strategies for classroom management and organization (Adeyemi 2010). A principal's performance can be measured in terms of teaching, lesson preparation, mastery of subject matter, commitment to job and extra – curricular activities, effective supervision and monitoring of students" work, class control and disciplinary ability (Munir & Khalil, 2016).

The word conference may simply refer to a group of teachers or academics presenting and arguing about a theme or topic on a college campus. Conference can also be seen as "a large official meeting at which people with same work or interest come together to discuss their views". Teachers" conference is primarily aimed at enabling them perform their current jobs and help them acquire the knowledge and skills they need to be effective teachers. Conference is equally re-training exercise to make teachers" up to date in their profession. Conferences are also used to tackle a single or set of problems (Amie-Ogan & Nda, 2020).

A conference is a gathering of people with a common interest or background, with the purposes of allowing them to meet one another and to learn about and discuss issues, ideas and work that focus on a topic of mutual concern (Kamel Boulos & Wheeler, 2007). The Latin roots of the word "conference" mean, literally, "Bring together." A conference brings together people and ideas. In the cases of health and community work, conferences often have the goal of generating or working toward solutions to problems or broader social change.

A workshop is an interactive training where participants carry out a number of training activities rather than passively listening to a lecture or presentation. It is also seen as a re-training exercise not to upgrade qualification but to update knowledge and skills. According to Neustaedter, Venolia, Procyk and Hawkins (2016) effective workshop is built around what is practiced and relevant to the need of the learners' perspective. The main aim of workshops is to acquire new knowledge and skills that are related to the work of the participants. They identify needed change in behavior, learn new skills, and practice behavior in simulated work environment. Through workshops, principals are exposed tonew skills which they may not necessarily acquire in the school. Hara (2000) affirmsthat workshops tend to be smaller and more intense than seminars and often involvesparticipants trying new skills during the event under the watchful eye of the instructors.

Methodology

The research design that was adopted for this study was descriptive survey design. Descriptive survey is suitable for the study of the large population as it allows for a comprehensive study and selection of samples to derive from a population, so as to discover the distribution, interrelations and the relative incidence of sociological and psychological variables (Fraenkel, Wallen, & Hyun, 2012). The study targeted a population of 34,116 consisting of 2075 principals, 30993 teachers and 1048 (MOE) officials.The sample size of the study was 378 as guided by Research Advisor (2006). Using proportionate sampling technique, the validated and reliable research questionnaire was administered.The information collected from principals, teachers and MOE officials (Respondents) through questionnaire was analysed through frequency counts, simple percentages, mean and standard deviation, as well as the Kruskal-Walli's test.

Results

The results of the study are presented based on the outlined objectives as follows:

Objective 1: Impact of Principals' Participation in Conferences on their Performance in Administering Secondary Schools in North-West Zone, Nigeria.

Table 1: Responses of Respondentson the Impact of Principals' Participation in Conferenceson their Performance in Administering Secondary Schools in North-West Zone, Nigeria

S/N	Item Statement	Categories of Respondents	Responses				Total	
			Agree		Disagree		Mean	SD
			FRQ	%	FRQ	%		
1.	Through conferences, principal in my School learns new instructional strategies and this enables him/ her to perform better in the school.	Principal Teachers MOE Officials	24 308 14	96 90.8 92.9	01 31 01	0.4 9.2 7.1	3.4000 3.3333 3.5714	.57735 .67353 .64621
2.	Through conferences, principal in my School supervises teachers during lesson and this improves his/her performances in the school	Principal Teachers MOE Officials	24 301 13	96 88.8 92.9	01 38 01	0.4 11.2 7.1	3.4000 3.2419 3.5714	.58310 .66654 .64621
3.	Through conferences, principal learns how to manage and control the activities of the school and this enhances his/her performances as a leader in the school	Principal Teachers MOE Officials	24 321 14	96 94.7 100	01 18 00	0.4 5,3 00	3.2800 3.2419 3.5000	.54150 .61177 .51887
4.	Through conferences, principal in my school learns how to take	Principal Teachers MOE Officials	23 307 14	93 80.6 100	02 32 00	0.8 9.4 00	3.0400 3.1239 3.3571	.61101 .0.6454 .49725

No.	Statement	Respondent					Mean	Std
	good decision in the school and this helps in improving his/her capacity, hence improved performance in the school							
5.	Through conferences, principal in my school learns how to maintain all the school facilities, and this improve students' performances in the school.	Principal Teachers MOE Officials	24 312 13	96 92 92.9	0.1 27 0.1	0.4 8 7.1	3.2000 3.2271 3.2142	.50000 0.6561 ..57893
6.	Through conferences, principal in School learns how maintain discipline in the school, this helps to prove his/her performances in the school	Principal Teachers MOE Officials	22 295 14	88 87 100	0.3 44 00	12 13 00	3.1600 3.2743 3.64286	.62450 0.7527
7.	Through conferences, principal in my school learns how to maintain relationship between the school and the community.	Principal Teachers MOE Officials	24 310 14	96 91.4 100	0.1 29 00	0.4 8.6 00	3.2400 3.295 3.4285	.2281 0.6717 .51355
8.	Through conferences, principal in my school learns how to lead by example and this enable thim/ her to perform better in the school.	Principal Teachers MOE Officials	23 305 13	92 90 92.9	0.2 34 1	0.8 10 7.1	3.1600 3.2271 3.21429	.68799 .0.6955 .57893
9.	Through conferences, principal's knowledge increases and this helps to enhance his/her performances in the school.	Principal Teachers MOE Officials	22 311 14	88 91.7 100	3 28 00	12 8.3 00	3.0800 3.1917 3.2857	.57155 0.607 .46881
10.	Through	Principal	23	92	02	08	3.1200	.52599

conferences, principal learns how to effectively communicate and this enhances his/her performances in and outside school.	Teachers	302	89	37	11	3.1858	.7077
	MOE Officials	12	85.8	02	14.2	3.28561	.72627

(Cumulative Mean: 3.25 > 2.5 Decision Mean)

In table 1, there were divergent opinions between principals, teachers and MOE Officials in response to item statement 1-10 items 1 attempted to find out whether through conferences, principal in my School learns new instructional strategies and this enables him/ her to perform better in the school from the result, it was found that 96% principals, 90% of teachers and 92% of MOE Official agree with the statement. Item 2 attempted to find out whether through conferences, principal in my School supervise teachers during lesson and this improves his/her performances in the school. The computed result revealed that 96% of principals, 88.8 of teachers and 92% 0f MOE Official agreed with the statement. Item 3 investigated whether through conferences, principal learns how to manage and control the activities of the school and this enhances his/her performances as a leader in the school. According to the result of 96%of principals, 94.7% of teachers and 10% of OME Officials agree with the ideal. Item 4 investigates whether through conferences, principal in my school learns how to take good decision in the school and this helps in improving his/her capacity, hence improved performance in the school. Based on the discovered result, the total of 93% of principals, 80.6 of teachers and 100% of MOE Officials accepted with the statement. Item 5 opinion of the Respondents was asked whether through conferences, principal in my school learns how to maintain all the school facilities, and this improve students' performances in the school. The calculated responses revealed that 96% of principals, 92% of teachers and 92% of MOE Official agree with the statement. Item 6 asked whether through conferences, principal in my School learns how to maintain discipline in the school, this helps to improve his/her performances in the school. The stance taken by 88% of principals, 87% of teacher's and 100% the confirmed their view by accepting that trough conferences principal learn how to maintain discipline in schools. Item 7 attempted to find out whether through conferences, principal in my school learns how to maintain relationship between the school and the community the result

revealed that 96% of principals, 91.4% of teachers and 100% of MOE Official agree with the ideal. However, item 8 investigated whether through conferences, principal in my school learns how to lead by example and this enable him/her to perform better in the school. Based on the computed result all of 92% of principals, 90% of teachers and 92.9 agree with the statement. For item 9 whether through conferences, principal knowledge increases and this helps to enhance his/her performances in the school. The responses of the Respondents indicate that 88% of principals, 91.7 of teachers and 100% of OME Official all accepted with the statement. On item 10 it is evident that through conferences, principal learns how to effectively communicate and this enhances his/her performances in and outside school. The opinion of the responses show that 92% of principals, 89% of teachers and 85.8 of MOE Officials agree with the ideal respectively.

Objective 2: Impact of Principals' Participation in Workshops on their Performance in Administering Secondary Schools in North-West Zone, Nigeria

Table 2: Responses of Respondents on the Impact of Principals' Participation in Workshops on their Performance in Administering Secondary Schools in North-West Zone, Nigeria

S/N	Item Statement	Categories of Respondents	Responses				Total	
			Agree		Disagree		Mean	SD
			FRQ	%	FRQ	%		.
11.	Through workshops principal in my School learns new instructional strategies and this enables him/ her to perform better in the school	Principal	24	96	01	0.4	3.36000	.70000
		Teachers	312	92	27	08	3.3599	.7300.
		MOE Officials	14	100	00	00	3.57143	5.51355
12.	Through workshops, principal in my School supervises teachers during lesson and this improves his/her performances in the school	Principal	3	92	02	08	3.2000	.57735
		Teachers	320	94.4	19	5.6	3.3304	..6081
		MOE Officials	14	100	00	00	3.5000	..51887
13.	Through workshops principal learns how to manage and control the activities of the school and this enhances his/her performances as a leader in the school	Principal	22	88	02	12	3.0400	..53852
		Teachers	302	89.1	37	10.9	3.1829	..6632
		MOE Officials	14	100	00	00	3.42857	..51355
14.	Through workshops principal in my school learns how to take good decision in the school and	Principal	24	96	01	0.4	3.4800	..58595
		Teachers	317	93.5	22	6.5	3.4218	..6312

	this helps in improving his/her capacity, hence improved performance in the school	MOE Officials	13	92.9	01	7.1	3.42857	..64621
15.	Through workshops principal in my school learns how to maintain all the school facilities ,and this improve students' performances in the school	Principal	23	92	2	08	3.16000	1.55377
		Teachers	319	94.2	20	5.8	3.4395	11.7351
		MOE Officials	14	100	00	00	3.35714	0.49725
16.	Through workshops, principal in my School learns how to maintain discipline in the school, this helps to improved his/her performances in the school	Principal	24	96	01	04	3.2800	..54160
		Teachers	302	87	44	13	3.2596	0.7441
		MOE Officials	14	100	00	00	3.35714	0.63332
17.	Through workshops principal in my school learns how to maintain relationship between the school and the community	Principal	25	100	00	00	3.3600	..48990
		Teachers	316	93.2	23	6.8	3.3717	0.6819
		MOE Officials	13	92.9	01	7.1	3.35714	0.63332
18.	Through workshops, principal in my school learns how to lead by example and this enable thim/ her to perform better in the school	Principal	25	100	00	00	3.1600	..37417
		Teachers	316	93.2	23	6.8	3.233	0.6495
		MOE Officials	14	100	00	00	3.35714	0.49725
19.	Through workshops, principal knowledge increases and this helps to enhance his/her performances in the school	Principal	24	96	01	04	3.4800	..58595
		Teachers	311	91.7	28	8.3	3.3599	0.6839
		MOE Officials	13	92	00	00	3.57143	3.64621
20.	Through workshops, principal learns how to effectively communicate and this enhances his/her performances in and outside school	Principal	23	92	02		3.2800	..54160
		Teachers	302	89	37	11	3.3038	0.721
		MOE Officials	13	92.9	01	7.1	3.35714	0.8419

(Cumulative Mean: 3.33 > 2.5 Decision Mean)

In table 2, there were divergent opinions between principals, teachers and MOE Officials in response to item statement 21-30 items 11 attempted to investigate whether throughworkshops, principal in my School learns new instructional strategies and this enables him/her to perform better in the school from the result, it was found that 96% principals, 92% of teachers and 100% of MOE Official agree with the statement. Item 12 attempted to find out whether through workshops, principal in secondary School supervises teachers during lesson to improve his/her performances in the school. The computed result revealed that 92% of principals, 94.4 of teachers and 100% 0f MOE Official agreed with the statement. Item 13 to find out whether

through workshops, principal learns how to manage and control the activities of the school and this enhances their performances as a leader in the school. According to the result of 88%of principals, 89.1% of teachers and 100% of OME Officials agree with the ideal. Item 14 investigates whether through workshops, principal in my school learns how to take good decision in the school and this helps in improving his/her capacity, hence improved performance in the school. Based on the discovered result, the total of 96% of principals, 93.5 of teachers and 92.9% of MOE Officials accepted with the statement. Item 15 opinion of the Respondents was asked whether through workshops, principal in my school learns how to maintain all the school facilities, and this improve students' performances in the school. The calculated responses revealed that 92% of principals, 94.2% of teachers and 100% of MOE Official agree with the statement. Item 16 sought to find out whether through workshops,principal in my School learns how to maintain discipline in the school, this helps to improve his/her performances in the school. The stance taken by 96% of principals, 87% of teacher's and 100% the confirmed their view by accepting that trough workshops, principal learn how to maintain discipline in schools. Item 17 attempted to find out whether through workshops, principal in my school learns how to maintain relationship between the school and the community the result revealed that 100% of principals, 93.2% of teachers and 92.9% of MOE Official agree with the ideal. However, item 18 investigated whether through workshops, principal in my school learns how to lead by example and this enable him/her to perform better in the school. Based on the computed result all of 100% of principals, 93.3% of teachers and 100% agree with the statement. For item 19 whether through workshops, principal knowledge increases and this helps to enhance his/her performances in the school. The responses of the Respondents indicate that 96% of principals, 91.7% of teachers and 92% of MOE Official all accepted with the statement. On item 20 it is evident that through workshops, principal learns how to effectively communicate and this enhances their performances in and outside school. The opinion of the responses showed that 96% of principals, 89% of teachers and 92% of MOE Officials agree with the ideal respectively.

Hypothesis one:

Table 3: Summary of Kruskal-Wallis H-Test for showing no Significant Difference on Impact of Principals' Participation in Workshops on their Performance in Administering Secondary Schools in North-West Zone, Nigeria

Status	N	Mean Rank	H-value	Df	H-critical	p-value	Decision

Teachers	339	189.28	1.903	2		.386	Retain H$_O$2
Principals	25	173.44			**5.99**		
MOE Officers	14	223.39					
Total	**378**						

Table 3 shows the statistical result of hypotheses testing was presented. The computed result shows that H- Cal is equal to 1.903 while the H-critical is equal to 5.99 at 0.05 alpha level and Df is equal to 2 as shown, the P value equal .386 is more than the alpha level (0.05). Therefore, the hypothesis is retained means that there is no significant difference on impact of workshops on principals' performance in their Administering Secondary Schools in North-West Zone, Nigeria.

Hypothesis Two

Table 4: Summary of Kruskal-Wallis H-Test showing no Significant Difference on Impact of Principals' Participation in Seminars on their Performance in Administering Secondary Schools in North-West Zone, Nigeria

Status	N	Mean Rank	H-value	Df	H critical	p-value	Decision
Teachers	339	187.76	. .843	2	5.99		Retain H$_O$3
Principals	25	204.68				.656	
MOE Officers	14	204.50					
Total	**378**						

Table 4 showed thestatistical result of hypotheses testing. The computed result shows that H- Cal is equal to 1843 while the H-critical is equal to 5.99 at 0.05 alpha level and Df is equal as shown, the P value equal 0. 656 is more than the alpha level (0.05). Therefore, the hypothesis is retained means that there is no significance difference on impact of seminars on principals' performance in their administering secondary schools in North-West Zone, Nigeria.

Discussion

Findings indicate that there was consensuses among respondents that principals participation in conferences have positive and significant impact on principals job performance in secondary schools. This was in line with the opinion of Amadi (2013) who opined that in service training and professional development of teachers provide them with necessary skills in making public presentations and writing scholarly papers and also enhanced their skills in teaching, Arinze P N (2024) revealed that, through conferences principals learnt how to supervise

the teachers during lesson and this improves their performances in the school. In addition, the Respondents agreed that through conferences principal gained knowledge that was directly relevant to their teaching subject, how to maintain discipline in the school and also maintain relationship between the school and the community. Meanwhile, based on the empirical studies , it could be understood that principal collaborate effectively with one another. in conferences in other to share and exchange views this improved their capacity and provide them with needed skills in discharging their duties diligently. The respondents agreed that there is no significant difference in the opinion of principal's participation in workshops on their performance in secondary schools in North-West zone Nigeria. This portrayed the fact that, workshops exhibits practical activities that updated principal knowledge to enable him discharge his leadership responsibilities with diligence and commitment,

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Impact of Gaminification on Students Academic Performance in Basic Science and Technology in Junior Secondary Schools in Ondo State, Nigeria

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Abstract

The study examined the impact of gaminification on secondary school students' academic performance in Basic Science and Technology (BST) in Ondo State. The study adopted pretest -posttest control group quasi experimental research design. The population of the study consisted of all Junior secondary school students in Ondo State. While the sample population consisted of 120 Junior Secondary School (JSS) Students randomly selected from four secondary schools in Akure South local government area of Ondo State. Three objectives and three hypotheses were set and formulated for the study respectively. Two instruments were used in the study, they are; (i) Basic Science and Technology Students' Performance Test (BSTSPT) and (ii) Instructional Game Package (IGP). Intact classes were used in all the sampled schools. The participants were divided two groups (experimental and control). The experimental groups were taught with IGP. While the control groups were taught with Conventional Teaching Method (CTM). The data were analyzed using Analysis of Covariance (ANCOVA). The results revealed that students taught with IGP performed significantly better than their counterparts taught with the conventional teaching method. The study also shows that there was no significant difference between the academic achievements of male and female students taught with IGP. The findings further revealed that there was no significant difference between urban and rural BST students' academic achievement taught with IGP. Based on the findings, it was recommended that the use of IGPshould be encouraged in secondary schools. Both male and female students should also be motivated further to use IGPin secondary schools. Also, it was recommended that both rural and urban schools should be encouraged to use IGP for instructions in school subjects particularly in Basic Science and Technology.

Keywords: Gaminification, instructional game package, conventional teaching method, secondary school, Basic science and technology

Introduction

Basic Science and Technology (BST) as one of the core subjects in Junior Secondary School curriculum in Nigeria, comprises of elements from biology, physical and health education, information technology, life sciences, environmental, chemistry, physics and introductory technology. The subject is concerned with finding out about things in

the environment, developing the individual for well-rounded life through well-rounded education with adequate resources (Oyekekan & Adewale, 2014). The subject presents science as a systematic body of knowledge about man, science and technology, space and phenomena (Chen & Howard 2010).

The aim of the Basic Science and Technology (BST) curriculum in schools is not only to transmit data and principles as in contemporary science and technology, but also to help learners perform well and acquire skills with which to tackle the challenges of life and continue life-long learning. The Nigerian Educational Research and Development Council (NERDC, 2007) further identified major relevance of the subject in the school curriculum as including; helping the learners to develop interest in science and technology, acquisition of basic knowledge and skillsinscienceandtechnology,applicationofscientificandtechnologicalk nowledgeand skills to meet societal needs, exploring and taking advantage of the numerous career opportunitiesofferedbyscienceandtechnology,andbecomingpreparedforf urtherstudies in science andtechnology

Despite all these relevance of Basic Science and Technology in the school curriculum, literatures such as Aderele and Abidoye (2022) claimed that the teaching of the subject still characterized with the use of conventional method of teaching which does not give room for active participation of learners in the teaching and learning of the subject. They stated further that conventional method of teaching is teacher centred in nature. The use of this inappropriate method of teaching often leads to poor academic achievement of learners in the subject. However, in the quest to discover new ways of facilitating effective teaching and learning of Basic Science and Technology (BST), there is great need to foster innovative and technology-based teaching strategy aimed at improving students' interest and academic performance in the subject. One of such innovative and technology-based strategies that can be effectively used for teaching of BSTand improving students' academic performance in the subject is gaminification instructional strategy (Papasteriou 2019).

Gamification according to Daniel (2011) is the integration of gaming dynamics in non-gaming environments. Hanus (2015) also refers to gaminification as the process of employing game components (like points scoring, competition, rewards system and other principles of game play) in a non-game situation to stimulate engagement and

motivate participants to achieve a desired goal or behavior. Games and game elements have been used as tools for learning as they help simulate real-life situations in safe and often entertaining environment and they often tend to engage players and participants so much that they are emotionally immersed in the process, thereby enjoying the task and challenges it offers.

The use of games particularly for instruction can encourage learners to build relationships with the environment, express emotions, gain experiences, have a good time, relax and find solutions to the problems (Daniel 2011).Hanus (2015)posits that gamification fosters learner motivation and generally helps learners receive positive feedback during teaching process. Papasteriou (2019) also claims that games lead learners to display positive attitude and have positive influences over success. Siegler & Ramani, (2018) avert that games have always been effective tools to draw the attention of learners towards the learning content in the class.

Gender differences is one of the factors that affect the use of technology in teaching and learning process. Gender refers to the socially constructed characteristics of women and men – such as norms, roles and relationships between male and female (Aderele and Abidoye 2022). Abidoye& Abidoye (2022) also describes gender as the socially and culturally constructed characteristics and roles which are ascribed to males and females in any society. He described the male attributes as bold, aggressive, tactful, and efficient in the use of words while the females are fearful, shy, gentle, dull, submissive and effusive. In the same vein, Umoh (2003) stated that more complex works are usually set aside for male, while the females are considered womanly in a natural setting. Damia (2014) concludedthat there was a significant effect of gender on students' academics self-concept in favour of the female students than their male counterparts.

Another learning characteristic that can influence students' academic achievement in Basic Science and Technology is school location. School location could either be urban or rural. The urban environment can be conceptualised as that which has high population density, contains a high variety of beautiful commonplace views and enough social amenities, whereas the rural environment is characterized by lowreports that school location in favour of urban centres has significant effect on student attitude towards mathematics and chemistry and any other school subjects.

Statement of the Problem

The problem of persistence low academic performance in Basic Science and Technology (BST) by secondary school students has been a major concern to educators. Researchers such as Aderele and Abidoye (2022) have identified a number of possible contributing factors to this issue, including the teaching strategies employed by teachers. In particular, the traditional "chalk and talk" method, which involves the teacher talking to students while writing notes on the board, has been criticized for its lack of interactivity, ability to engage and motivate students, and its inability of equipping students with the necessary scientific skills and mindset. However, a more effective technology-based learning strategy that is learner-centered and activity based needs to be explored for the teaching and learning of Basic Science and Technology. One of such technological-based instructional strategies that can enhance students' academic performance is Gaminification (Hanus (2015). However, literatures have revealed that as at the time of carrying out this research, there were little researches on the effectiveness of Gaminificationin the teaching and learning of Basic Science and Technology especially in Akure South local government area of Ondo State. Hence, this research examines the impact of Gaminification on students' academic performance in Basic Science and Technology in Junior Secondary Schools in Ondo, Nigeria.

Objectives of the study

The study aims at achieving the following objectives:

1. to determine the effect of gaminification on secondary school students' academic achievements in Basic Science and Technology.

2. to determine the effect of gender differences on secondary school students' academic achievements in Basic Science and Technology.

3. to determine the effect of school location on secondary school students' academic achievements in Basic Science and Technology.

Hypotheses of the Study

HO1: There is no significant effect of treatment on students' academic performance in Basic Science and Technology.

HO2: There is no significant effect of gender on the students' academic performance in BasicScience and Technology.

HO3: There is no significant effect of school location on students' academic performance in Basic Science and Technology.

Methodology

This study adopted pretest-posttest, control group quasi, experimental research design. The sample population for this study consisted of 120 Junior Secondary School 2 (JSS2) students from four schools randomly selected in Akure South Local Government. Purposive sample technique was used to select the sample schools. Schools that have functional ICT laboratory and facilities were selected for the study. Intact classes were used in all the sampled schools. Two schools sampled for experimental and two schools were sampled as the control groups. Two instruments were used in the study. They are; Basic Science and Technology Students' Performance Test (BSTSPT) and Instructional Game Package (IGP). All the instruments were validated by experts. The experimental groups were taught Basic Science and Technology with the use of IGP, while the control groups were taught with the use of conventional teaching method. All hypotheses were tested using ANCOVA statistical tool at 0.05 level of significance.

Results

Ho1: There is no significant main effect of treatment on students' academic performance in Basic Science and Technology.

Table 1. Summary of Analysis of Covariance (ANCOVA) on Students' Performance in Basic Science and Technology

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9157.469[a]	8	1144.684	14.849	.000	.517
Intercept	16552.420	1	16552.420	214.719	.000	.659
Pretest	3.438	1	3.438	.045	.833	.000
Treatment	8577.454	1	8577.454	111.267	.000	.501
Location	21.354	1	21.354	.277	.600	.002
Gender	82.257	1	82.257	1.067	.304	.010
Treatment * Gender	102.575	1	102.575	1.331	.251	.012
Error	8556.856	111	77.089			
Total	408621.000	120				
Corrected Total	17714.325	119				

Dependent Variable: Students' Achievement in Basic Science and Technology (posttest)
R Squared = .517 (Adjusted R Squared = .482)

Table 1 reveals, that there is significant main effect of treatment (gaminification) on the students' academic performance in Basic Science and Technology (F(l, 111) = 111.267; p <0.05; partial η2 = .501). The treatment effect size is 51% (partial η2 x 100). This result means that there is significant difference in the post-performance mean scores of the students due to the treatments. Hence, hypothesis 1 is rejected. In order to determine the mean difference across the groups, the Estimated Marginal Means of the treatment group were carried out and the result is presented in Table 2 below.

Table 2: Estimated Marginal Mean on Students' Achievement, across the Groups Variables

Variables		N	Mean	Std. Error
INTERCEPT				
	Pretest	120	42.78	-
	Posttest	120	57.47	.82
TREATMENT				
	Experimental Group	57	66.12	1.189
	Control Group	63	48.84	1.125
GENDER				
	Male	53	56.61	1.226
	Female	67	58.33	1.105
LOCATION				
	Urban	65	57.03	1.134
	Rural	55	57.91	1.203

Table 2 reveals that the mean score for the performance of the students before the experiment was 42.78 while it became 57.47 after the experiment. The table shows further that the students exposed to Basic Science and Technology lessons through gamification had better performance (= 66.12) than those in the control group (= 48.84). Again, the table shows that the male participants had lower achievement (= 56.61) than the female ones (= 58.33). Also, from the table, it was revealed that students from both Urban and Rural had almost the same performance with (= 57.03) and (=57.91) respectively. This result implies that the Gamification is highly effective in improving students' performance in Basic Science and Technology.

Ho2: There is no significant main effect of gender on the students' academic performance in Basic Science and Technology.

Also from table 1, it was observed that there is no significant main effect of gender on students' performance in Basic Science and Technology (F(l, 111) = .067; p >0.05; partial η2 = .010). The effect size is 10%. This means that gender does not have any significant effect on the students' performance scores' when using gaminification instructional approach in learning Basic Science and Technology. Hence, hypothesis 2 is retained.

Ho3: There is no significant main effect of school location on students' academic performance in Basic Science and Technology.

From table 1, there is no statistically significant effect of school location on students' academic performance (F(l, 111) = .277; p > 0.05; partial η2 = .002). The effect size is 0.2%. This means that school location does not have any significant effect on the students' academic performancescores' when using gamification instructional approach in learning Basic Science and Technology. Hence, hypothesis 3 is retained.

Discussion

The finding of this study revealed that there is significant difference between the academic performance ofBasic Science and Technologystudents taught with Instructional Game Package (IGP) than their counterparts taught with conventional teaching method. This could be because the use ofIGP helped students to have better understanding of learning contents which led to the improvement in their academic performance. This finding is consistent with the findings of Nwachukwu & Johnson (2020) who reported that the use of gaminification improved academic performance of Junior Secondary school students in Basic Science in River state, Nigeria.

It was also revealed from this study that there was no significant difference between male and female students' academic performance taught with Instructional Game Package.This implies that students whether males or females are similar inusing IGP. This is in line with the finding of Elian and Hamaidi (2018) who revealed that there was no differences in male and female academic achievements when taught with mobile phone instructional package.

Findings on the effect of school location on the academic performance of students taught with Instructional Game Package revealed thatschool location has no significance effect on students' academic performance. This finding is against the finding of Mouza (2008) who

finds out that students from urban environment performed consistently higher than the students in the rural schools.

Conclusion

The study focused on the need to improve the teaching and learning of Basic Science and Technology in Junior Secondary Schools through the use of Instructional Game Package. The findings of the study revealed the superiority of Instructional Game Package to conventional teaching method of teaching Basic Science and Technology (BST) in the sense that it has led to significant difference in the students' academic performance in Basic Science and Technology.

Recommendation

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

1. Secondary school teachers especially Basic Science and Technologyteachers should be educated through seminars, workshops, and training on the instructional benefits of gaminification especially IGP and be encouraged to optimized these benefits for total instructional delivery in secondary schools.

2. Training and workshops should be organized for secondary school teachers on the use of Instructional Game Package.

3. iii State ministries of education, the federal government and NGOs should provide schools with necessary infrastructures and financial supports that will encourage the use of game-basedinstructional strategies in schools especially secondary schools.

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Low Enrolment of Female Students in Tertiary Educational Institutions in Sokoto State, Nigeria: Cause, Challenges and Way Forward

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Abstract

This study examined the low enrolment of female students in tertiary institutions in Sokoto State. The study employed a descriptive survey research, where the samples size of 373 and 585 from the population of 12,301 female students and cluster population were drawn respectively. Two self-designed instruments tagged: Challenges of Female Students in Tertiary Educational Institutions Questionnaire (CFSTEIQ) and Factors Causes Low Enrolment of female Students in Tertiary Institutions Questionnaire (FCLEMFSTIQ) were used for the study. The instruments were validated by experts based on face and content validities. The reliability indices of 0.82 and 0.75 were obtained respectively. The findings of the study revealed that female students in tertiary institutions in Sokoto State are faced with challenges of inadequate accommodation, low incomes, lack of proper counselling, inadequate toilet and sanitation facilities, and un-conducive learning environment among others. The study further revealed that widespread of poverty, fear of profound negative change of female students by parents, high cost of education, socio-cultural beliefs are some of the causes of low enrolment of female students. The study recommended among others that, there should be financial aid programmes for females at higher educational institutions to improve their enrolment, there should be conducive learning environment for female students, adequate and appropriate facilities should be provided; and there should be rigorous campaign against religious misinterpretations to enhance the credibility of gender norms and change perceptions and attitudes of people towards females' education.

Keywords: Female Students, Low Enrolment, Female education, and Tertiary Institutions

Introduction

Female education is the catalyst for the development of social, economic, and technological advancement. Educated women are less likely to die in childbirth and more likely to have healthy and well-nourished children than their non-educated counterparts (Ogunode, Ahmed & Muhammad, 2021). According to British Council (20120 a child born to a literate mother is 50% more likely to survive and past the age of five. In Nigeria, 66% of mothers with secondary education gave birth in a health facility compared to 11% with no education. A

survey of the recent census results reveals that women constitute about fifty percent (50%) of the population in Nigeria (Okoje, 2001). By implication, women are not a negligible few that can be discarded with a wave of the finger.

The enrolment of females into tertiary education has a strong relation with girls' education today, since the prerequisite requirements for continuation of females' education into tertiary institution is largely depends on the successful completion of girls' education. Therefore, for women to carry out their responsibilities judiciously as mothers, house wives, family and society members, as well as to face current life challenges they need to be educated (United Nations Education Social and Cultural Organisation [UNESCO], 2014; Oluyemi & Yinusa, 2016). Education is important foundation for improving the status of women and has also been recognised as the fundamental strategies for development (Silas, Shagari & Innocent, 2018). According to the British Council (2014) educating girls contributes significantly to the development of stable, prosperous and healthy nation, the state which citizens are active, productive and empowered. Yet the data indicated that in Nigeria: Over 5.5 million girls are out of school in Nigeria (UNESCO, 2014); 40% of women and 28% of men have never attended school (National Population Commission Nigeria [NPC], 2009); Nearly two third women in the North West and North East regions have no education compared to less than 15% in the South-South (NPC, 2009); The enrolment rate at primary level is 39% for girls and 61% for boys (UNESCO, 2014). According to a report in the year 2017 27,092 students completed their secondary education in Sokoto State, out of which 8,498 are girls with 31.4%, while 18,594 are boys with 68.6% (National Bureau of Statistics Nigeria. 2019).

The evidence from other researchers indicates that there is a disparity in the enrolment and performance of females in tertiary educational institutions in North West, Nigeria among which are Sokoto State. Such disparity will affect the contribution of females in National development and the achievement of Sustainable Development Goals in Nigeria and Sokoto State in particular. This may be linked to the various challenges facing female students and factors influencing low enrolment of female students in tertiary educational institutions in Nigeria. A study by Ogunode et al. (2021) showed that inadequate funding of universities, inadequate female hotels, classrooms, and poor implementation of policies protecting female students from sexual harassment are challenges affecting woman education at the university level while in the demand side; poverty, cultural factors,

early marriage, fear of insecurity, high cost of university education are the factors preventing woman education at the university level in Nigeria. Similarly, the study of Mvendag, Ifeanyichikwu and Apine (2014) revealed that, the problems facing female child education in Kebbi State was not far from poverty, early marriage, cultural and religious misconceptions. A germane study by Iro-Idoro et al. (2014) indicated that there is a meaningful difference between individual and environmental barriers to female education and order of effectiveness of barriers based on their age and marital status. In addition, Muthoni (2007) found that poverty, low distances to school, negative attitude, time wastage by teachers, drug and substance abuse, security, household chores, boy preference, pregnancies and early marriages were the factors established to influence enrolment and retention of girls in schools. Thus, in order to improve the situation, we need to know the challenges of female students and factors causes low enrolment of female students in tertiary educational institutions in Sokoto State.

Objectives of the Study

The main objective of this study is to assess the causes of low enrolment of female students in tertiary institutions in Sokoto State. Thus, the specific objectives of this study are to:

1. find out the challenges of female students in tertiary institutions in Sokoto State; and

2. investigate the causes of low enrolment of female students in tertiary institutions in Sokoto State.

Research Questions

Based on the statement of the problem of the study, the following research questions were raised to guide the study:

1. What are the challenges of female students in Tertiary Institutions in Sokoto State?

2. What are the causes of low enrolment of female students in tertiary institutions in Sokoto State?

Review of Related Empirical Studies

A lot of related literatures on the causes of low enrolment of female students in tertiary institution were written. A related study by

Mvendag, Ifeanyichikwu and Apine (2014) investigated the problems and challenges of girl child education in Nigeria: the situation in Kalgo Local Government Area, Kebbi State. The study revealed that, the problems facing girl child education in Kebbi State was not far from poverty, early marriage, cultural and religious misconceptions. The study recommended among others things that, government, non-governmental organisations, parents and traditional rulers should join hands in the enlightenment campaign for changing the trend.

A similar study by Ogunode et al. (2021) examined the perception of undergraduate female students on the challenges facing women's education at the university level. The study adopted a descriptive survey research design. The result collected and analysed showed that inadequate funding of universities, inadequate female hotels, classrooms, and poor implementation of policies protecting female students from sexual harassment, and strike action by different unions groups in the universities are challenges on the supply side affecting the woman education at the university level while in the demand side; poverty, cultural factors, early marriage, fear of insecurity, high cost of university education are the factors preventing woman education at the university level in Nigeria.

Similarly, Noori and Orfan (2021) study investigated the challenges of undergraduate married female students in higher education of Afghanistan. It also explored whether the participants' demographic variables such as class, age and residential areas had any effect on their responses. The study employed a quantitative research design. Using survey questionnaire with 29 items was used to collect the data from 100 purposefully selected respondents at Takhar University. The study found that Afghan married female students faced different problems during their studies at the university and the challenges had a significant effect on them. It also revealed that there were statistically significant differences in the responses of the students by their class, age and residential areas.

Muthoni (2007) investigated the factors that influenced low enrolment and retention rates of girls with disabilities in integrated primary schools. It further explored possible intervention measures that may be employed to mitigate the situation. The study was conducted in selected schools in Runyenjes (Embu East) and Manyatta (Embu North) sub-counties in Embu County. Poverty, low distances to school, negative attitude, time wastage by teachers, drug and substance abuse, security, household chores, boy preference,

pregnancies and early marriages were the factors established to influence enrolment and retention of girls with disabilities in school. Similarly, a germane study by Iro-Idoro et al. (2014) studied Challenges faced by adult female students in some faculties: The Nigerian experience. The results indicated that there is a meaningful difference between individual and environmental barriers to female education and order of effectiveness of barriers based on their age and marital status.

From all the related reviewed literature presently, there is no significant body of evidences that examines the enrolment of female students in tertiary institutions in Sokoto State. This study therefore, is unique from all the reviewed studies in terms of scope of the study, methodology, time, and geographical location.

Methodology

A descriptive survey was used for this study, the population of this study comprises all female students of selected institutions, religious leaders, parents/guardians and public members in Sokoto State. A convenient sampling technique was used to select five tertiary institutions in Sokoto State. Proportionate and simple random sampling techniques were used for selection of female students in tertiary institutions, based on their enrolment proportion of 2019/2020 academic session, using Research Advisors' (2006). The cluster sampling technique was used in selection of participants from three senatorial zones where five religious leaders, 40 parents/guardians of female(s) school going age (18 and above) and 20 public members selected from each three selected local governments in three senatorial zones as depicted table 1 and 2:

Table 1: Sample of Female Students in Selected Tertiary Institutions in Sokoto State, 2019/2020 Academic Session

S/N	Selected Institutions	Population	Sample
1	Sokoto State University, Sokoto (SSU)	1,586	48
2	Usmanu Danfodiyo University, Sokoto (UDUS)	7,105	216
3	Shehu Shagari College of Education, Sokoto (SSCOE)	638	20
4	Umaru Ali Shinkafi Polytechnic, Sokoto (UASPS)	2,466	74
5	Sultan Addur-Rahman College of Health Technology, Gwadabawa (SACHTG)	506	15
	Total	**12,301**	**373**

Source: Survey Field, 2020

Table 2: Sample of Public Members in Selected Local Governments in Sokoto Senatorial Zones

S/N	Local	Senatorial	Religious	Parents	Community	Total

	Government	Zone	Leaders		Members	Sample Size
1	Sokoto North	Sokoto Central	5	40	20	65
2	Wamakko	Sokoto Central	5	40	20	65
3	Silame	Sokoto Central	5	40	20	65
4	Yabo	Sokoto West	5	40	20	65
5	Tambuwal	Sokoto West	5	40	20	65
6	Dange Shuni	Sokoto West	5	40	20	65
7	Illela	Sokoto East	5	40	20	65
8	Sabon Birni	Sokoto East	5	40	20	65
9	Gwadabawa	Sokoto East	5	40	20	65
Total			**45**	**360**	**180**	**585**

Source: Field work, 2020

Two self-designed questionnaires were used as instruments for data collection: one for female students tagged: Challenges of Female Students in Tertiary Institutions Questionnaire (CFSTIQ); and second for religious leaders, parent and public individuals tagged: Causes of Low Enrolment of female Students in Tertiary Institutions Questionnaire (CLEFSTIQ), with ten item statements each. Thus, the questionnaires were designed based on a 4-point Likert scale in such a way that respondents are to tick SA = Strongly Agree (4 point); A = Agree (3 point); D = Disagree (2 points); and SD = Strongly Disagree (1 point).

The items of the questionnaires were validated by the experts in Education, their observations and corrections were strictly harmonized for final draft of the instruments which ensured the face and content validity of the instruments. Face validity refers to researchers' subjective assessments of the presentation and relevance of the measuring instrument as to whether the items in the instrument appear to be relevant, reasonable, unambiguous and clear (Oluwatayo, 2012). Content validity is a qualitative type of validity where the domain of the concept is made clear and the analyst judges whether the measures fully represent the domain (Kubai, 2019).

The reliability of the instrument refers to consistency of measure, Ghazali (2016) opined that reliability only concerns with the consistency of scores. Reliability is also concerned with repeatability, a scale or test is said to be reliable if repeat measurement made by it under constant conditions will give the same result (Moser & Kalton, 1989). Thus, a test retest method with an interval of two weeks was done to determine the reliability of the research instruments using Pearson Correlation Coefficient, where reliability indices of 0.82 and 0.75 at 0.05 level of significance were established for CFSTIQ and CLEFSTIQ respectively. These were considered high enough to judge the instruments as reliable for the study.

In order to achieve the objective of the study, all data collected from the field of study were subjected to statistical analysis for appropriate interpretations. Therefore, simple frequencies of responses percentages gathered from the questionnaire were used to obtain average mean and standard deviation of the data using the Statistical Package for Social Sciences (SPSS). The mean score of 2.50 was used as cut off point for decision rules, therefore any item with 2.50 and above was considered positive and below 2.50 was considered negative.

Results

The data obtained from research field were presented in tabular forms which were then used to convey the findings of the analysis. two research questions were answered and presented in table 3 – 4 to derive the findings.

RQ1: what are the challenges of female students in tertiary institutions in Sokoto State?

This research question was answered and presented in table 3.

Table 3: Responses of Female Students on the Challenges Faced by Female Students in Tertiary Educational Institutions in Sokoto State

S/N	Item Statement	N	Mean	SD	Decision
1	Inadequate accommodation is a challenge for females in the school	373	3.09	0.57	Challenging
2	Associating with bad friends and negative change in the attitudes of student is a challenge for female students in the school	373	3.05	0.51	Challenging
3	Lack of proper counselling on academic activities is a challenge for female students in the school	373	2.81	0.67	Challenging
4	Inadequate nutritional and prayer spaces is a challenge for female students in the school	373	2.04	0.75	Not Challenging
5	Inadequate toilet and sanitation facilities are challenges for female students in the school	373	3.14	0.62	Challenging
6	Poor communication skills is a challenge for female students in the school	373	2.90	0.70	Challenging
7	Low income of student is a challenge for female students in the school	373	3.02	0.51	Challenging
8	There is verbal and sexual harassment for female students in the school	372	2.31	0.65	Not Challenging
9	School environment is not friendly and conducive for female students in the school	373	2.86	0.77	Challenging
10	pregnancy for married female students is a challenge	373	3.51	0.53	Challenging

With use of a 4-point Likert scale type, the expected average mean of responses per item should be 2.50 either in favour or disfavour of what is being measured.

Source: Research field (2020)

In order to address the first research question on the challenges of female students in tertiary institutions in Sokoto State, the table 3

illustrates the mean and standard deviation of responses of female students from item 1 to 10 with their mean scores ranging from 2.04 to 3.51. The result indicated that eight items out of ten were considered as challenging for female students these include: Item 1 which says inadequate accommodation is a challenge for females in the school with mean score of 3.09; Item 2 which says Associating with bad friends and negative change in the attitudes of student is a challenge for female students in the school with mean score 3.05; Item 3 which says lack of proper counselling on academic activities is a challenge for female students in the school with mean score 2.81; Item 5 which says inadequate toilet and sanitation facilities are challenges for female students in the school with mean score 3.14; Item 6 which says Poor communication skills is a challenge for some female students in the school with mean score 2.90; Item 9 which says School environment is not friendly and conducive for female students in the school with mean score 2.86; and Item 10 which says pregnancy for married female students is a challenge with mean score 3.51.

The result also indicated that two items out of ten were not considered to be challenging for female students in the tertiary institutions in Sokoto State, these include: item 4 which says inadequate nutritional and prayer spaces is a challenge for female students in the school with mean score 2.04; and item 8 which says there is verbal and sexual harassment for female students in the school with mean score 2.31.

RQ2: what are the causes of low enrolment of female students in tertiary institutions in Sokoto State?

This research question was answered and presented in the table 4.

Table 4: Responses of Public Members on the causes of Low Enrolment of Female Students in tertiary institutions in Sokoto State

S/N	Item Statement	N	Mean	SD	Decision
1	Widespread of poverty is one of the factors causes low enrolment of females in tertiary institutions	568	3.32	0.47	Causing
2	Fear of Profound negative change in attitudes of female students discourages parents/guardians to enrol their daughters in tertiary institutions	568	3.09	0.96	Causing
3	Lack/inadequate security for female students discourages parents/guardians to enrol their daughters in tertiary institutions	568	2.34	0.97	Not Causing
4	High cost of female education makes parents/guardians not enrol their daughters in tertiary institutions	568	2.71	0.94	Causing
5	Socio-cultural beliefs discourages parents/guardians to enrol their daughters in tertiary institutions	568	2.82	1.09	Causing

6	Patriarchal of females by men and their impotent cause low enrolment of females in tertiary institutions	568	3.19	0.69	Causing
7	Lack of espouse to women western education from religious leaders causes low enrolment of females in tertiary institutions	568	3.52	0.64	Causing
8	Unawareness of parents regarding the significance of female education makes parents/guardians not enrol their daughters in tertiary institutions	568	2.86	1.10	Causing
9	Men preparedness of uneducated females than educated females makes parents/guardians sceptical to enrol their daughters in tertiary institutions	568	2.34	0.93	Not Causing
10	Investing in females education is seen as wasteful since she is going to married off to other family	568	2.30	0.94	Not Causing

With use of a 4-point Likert scale type, the expected average mean of responses per item should be 2.50 either in favour or disfavour of what is being measured.

Source: Research field (2020)

In order to address the research question two on the causes of low enrolment of female students in tertiary institutions in Sokoto State, the table 4 illustrates the mean and standard deviation of responses of parents, religious leaders and public members of item 1 to 10 with their mean scores ranging from 1.09 to 3.52. The result indicated that seven items out ten were considered to be the causes of low enrolment of female students in tertiary institutions in Sokoto State, these include: Item 1 which says widespread of poverty is one of the factors cause low enrolment of females in tertiary institutions with mean score of 3.32; Item 2 which says fear of profound negative change in attitudes of female students discourages parents/guardians to enrol their daughters in tertiary institutions with mean score 3.09; Item 4 which says high cost of female education parents/guardians find it difficult to enrol their daughters in tertiary institutions with mean score 2.71; Item 5 which says socio-cultural beliefs discourages parents/guardians to enrol their daughters in tertiary institutions with mean score 2.82; Item 6 which says Patriarchal of females by men and their impotent cause low enrolment of females in tertiary institutions with mean score 3.19; Item 7 which says lack of espouse to women western education from religious leaders causes low enrolment of females in tertiary institutions with mean score 3.52; and Item 8 which says Unawareness regarding the significance of female education makes parents/guardians not enrol their daughters in tertiary institutions with mean score 2.86.

Consequently, the result indicates that three items out of ten were not considered to be causes of low enrolment of females in the tertiary institutions in Sokoto State, these include: item 3 which says lack/inadequate security for female students discourages parents/guardians to enrol their daughters in tertiary institutions

with mean score 2.34; item 9 which says men preparedness of uneducated females than educated females makes parents/guardians sceptical to enrol their daughters in tertiary institutions with mean score 2.34; and item 10 which says investing in females education is seen as wasteful since she is going to married off to other family with mean score 2.30.

Discussion

The findings of this study revealed that female students in tertiary institutions in Sokoto State are faced with various challenges which include: inadequate accommodation, associating with bad friends, lack of proper counselling, inadequate toilet and sanitation facilities, poor communication skills, low income, un-conducive school environment and pregnancy during studies. These findings are consistent with the findings of Nasir and Al-Amin (2010) which established that when private spaces on campus are not accessible, female students have described uneasiness and nervousness. It also concords with the finding of Lasodea and Awotedua (2013) and Chen, Tabassum and Saeed (2019) which found that the need for counselling intervention to reduce the effect of the challenges faced by married female students, international students are lacking proper counselling in campuses, counselling may assist the students in coping with adjustment issues. Similarly, Muthoni (2007) found that there are no adequate toilet facilities for the female students in tertiary institutions. Jama and Barre (2019), Noori and Orfan (2021) found out that Poor English language skills are increasingly becoming a barrier to women education, it is also associated with cultural restrictions on women to circulate in public spaces. Egenti and Omoruyi (2011) and Ogunode et al. (2021) also found that poor economic or poverty is a strong factor preventing female education at the tertiary level. Lasode and Awotedua (2013) study found that pregnancy and homework is a challenge faced by married female students in Ogun State, Nigeria. Silas et al. (2018) also confirmed that overall, marital factor is seen as contributing to the low enrolment of female students in science subjects.

The study further revealed that the causes of low enrolment of female students in tertiary institutions in Sokoto State are widespread of poverty, fear of profound negative change of female students, high cost of female education, socio-cultural beliefs and lack of espouse to women western education from religious leaders. These findings are corroborated with the finding of Ogunode et al. (2021) which found

out that poverty is a strong factor preventing female education at the university level. similarly, James (2014) investigated the causes for decreasing enrolments of female students in secondary schools in Niger State and found that preference for private schools and the socioeconomic status of parents/guardians were significant factors. ILO Ability Asia, (2004) found that the woman's place in Asia was in the home and therefore, education for girls and women was seen as a distant dream, because they could not be wives, mothers and homemakers. Jama and Barre (2019) study found that most parents/caregivers cannot afford fees, transportation, textbooks and stationery and those facing economic difficulties often prefer to send their sons to school. Similarly, Bello and Oluwadare (2013) found out that the female is seen as being weaker in all fields of endeavours. In addition, Egenti & Omoruyi (2011) found that adult females in the educational program always faced some challenges which include time constraints, increasing marital demand, poor economic or financial base, poor learning environment, lack of encouragement from employers and spouse, increasing social pressure and poor psychological disposition. This study also conforms with the study of Wasagu (2007) which identified parental factor as restricting girls' access to education.

Conclusions

From the findings of the study it can be concluded that female students in tertiary institutions in Sokoto State are facing numerous challenges among which are: inadequate accommodation, profound negative change of attitudes, lack of proper counselling, un-conducive school environment and pregnancy during studies. The low enrolment of female students in tertiary institutions in Sokoto State was influenced by widespread of poverty, fear of profound negative change of female students, high cost of female education, socio-cultural beliefs and lack of espouse to women western education from religious leaders. Thus to improve females' enrolment in tertiary institutions for better women education and national development drastic measures should be taken to improve the situation by the government and school managers in collaboration with parents, religious/community leaders, community members, non-governmental organizations.

Recommendations

Based on the conclusions the study forwards the following recommendations:

1. Adequate and appropriate facilities such as hostels facilities, toilets facilities, classrooms and lecture halls facilities, transport facilities and health facilities should be provided to ensure conducive and friendly environment for female students.

2. To improve females' enrolment there should be financial aid programmes (scholarships, free or subsidise education, etc.) where only female studying or planning to study at higher education institutions will be eligible to apply. The government, local communities and NGOs should send out clear messages against religious misinterpretations to enhance the credibility and acceptance of new gender norms and to help change perceptions and attitudes towards girls and women's education. Enlightenment of parents on the importance of women education to national development.

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Towards Addressing the Challenges of Quality Education and Educational Inequalities in Nigeria

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Abstract

Education is pivotal for national, social, as well as cultural development and is a vital catalyst for individual growth, thus, every citizen need to have access to it. For education provision to achieve the purported goals, quality teaching and learning must be provided in schools. Nigeria's education sector however faces dual major challenges: inequality of educational opportunities and poor-quality education. The former is connected to the lingering problem facing the country such as insecurity, banditry, kidnapping, poverty, social inequality, secession ideology which continuously shaken the country's cohesion and existence. The latter increases the rate of unemployment, social unrest, brain drain and retards economic growth and development. Addressing these challenges will help the nation to navigate through the present ordeal and cumulate into collective development. Thus, the study adopted a qualitative approach, focusing on the analysis and synthesis of existing literature to explore the causes of both inequality of educational opportunity and poor quality education in the country. The study utilized various data sources, including academic journals and articles, books and book chapters, conference proceedings, government reports and policies, non-governmental organization (NGO) reports and online databases and repositories. The identified causes involved all stakeholders including the government, community, parents, school leaders and teachers, educational agents and students as well. The paper explored encompassing strategies in solving the problem.

Keywords: Education inequality, quality education, public private partnership, teacher training, community engagement, SDG

Introduction

United Nations in 2015 came up with 17 interconnected goals tagged Sustainable Development Goals (SDGs) aimed at making the whole world a comfortable abode for every living being. Goal 4 of the SDG initiative directly targeted at education, 'quality education' (Fafunwa, 2022). Quality education, indeed, is the bedrock of all other SDG goals and upon which their achievement rests. A well-educated population is the one that can drive economic growth, social progress, and cultural advancement (Adeniran & Okpanachi, 2018; Olaniyan,

2023). The time-bound specified for the attainment of the SDG goals is 2030. Nigeria, being part of the United Nations, still lags behind as far as educational sector development is concerned. Quality education in its real context is found wanton, and the quantity available is not accessible to the whole population of the country. Hence, the major challenges of educational sector in the country are accessibility and relevancy (Eli-Chukwu et al., 2023; UNESCO, 2024). Inaccessibility of education and irrelevancy of the content has been attributed to the insecurity currently facing the country (Fafunwa, 2022). The country has lost precious lives to the insurgency, banditry, militancy, and ethnoreligious conflicts whose causes are traceable to the duo problems. Many of those engaging in this social ill are the youth who majorly do not have access to quality education because they live in the remote areas or riverine areas. They lack exposure, basic skills, enlightenment, creative and critical thinking, hence, they can be easily manipulated and lured into evil act. Thus, solving insecurity in the country goes beyond lethal approach (Arikewuyo, 2022). Similarly, irrelevancy of the educational content has led to unemployment. According to National Bureau of statistics, the unemployment rate in Nigeria was 4.2. in Q2 2023 which is an increase of 0.1 from 4.1 recorded in Q1 of 2023 and it is expected to rise further in if necessary actions are not taken (National Bureau of Statistics, 2023).

Therefore, the problem of unemployment has always triggered social unrest and protests in the country such as Endsars, endbadgovernance and host of others. In fact, there has been pressing concerns for the rise of unknown gunmen, who have been responsible for numerous attacks and killings across the country. The factor attributed to this is the rise in the rate of unemployment among youths which is the result of failed educational sector (Adejumobi, 2022). In every social unrest witnessed in the country, billions worth of property were lost, government and private infrastructures were burnt and national cohesion eroded. The only way out is that the content of national education should be coherent with current economic reality and twenty first century requirements and accessible to all (Oxford, 2017, UNESCO, 2019). Economic growth, national development or social advancement is practically impossible without access to education and not just ordinary education but a quality one. An educated individual will possess skills and knowledge necessary for innovation, entrepreneurship, and productivity which will cumulate to economic progress of the nation (UNESCO, 2019, Oguniyi, 2022). A nation that denies her citizens access to education and fails to provide quality education has retarded her growth and

development. This really reveals in Nigeria production capability. The country is a consumption-based economy which heavily relies on importation (Adejumobi, 2022). Education determines individual social mobility. With academic attainment, individual moves from a social cadre to higher cadre. Education helps in bridging social and economic divides, foster equality and inclusivity (Oloro, 2022). In addition to this, civic engagement is shaped by the level of education received. The inaccessibility of education has led to political apparthy, eroded national unity and patriotism (Eli-Chukwu et al, 2023)

In fact, the statistics of educational accessibility and standard of education in Nigeria is pathetic. According to UNICEF, 10.2 million of primary school age children are out of school while 8.1 million who supposed to be in junior schools are also out of school. This represents one in out of three children in the country. The report asserted that 74percent children from the age of 8-14 lack basic literacy and over 1 million girls either dropout in the first or second year or do not attend school at all (UNICEF, 2024). Also, the recent university rankings by the 'Times Higher Education World University Rankings 2025' which evaluated universities in 108 countries based on 18 performance indicators across five key areas: teaching, research environment, research quality, industry, and international outlook. The ranking surveyed 1,907 universities across the world. Pathetically, it is a private university that led the race in Nigeria (Times Higher Education, 2024). This tells more about the situation and condition of our public institutions. Incessant strike action, dilapidated buildings, and unemployability have depleted standard in the public institutions (Fafunwa, 2022). For the nation to stand aright in the committee of nations and continue to stand as a giant of Africa, challenges of inaccessibility to education and irrelevancy of the educational content have to be responsibly addressed. Failure to do so will jeopardize effort to achieve Sustainable development goals, retard national development, increase social unrest and agitation, increase the rate of insecurity and shaken the existence and togetherness of the country. This paper therefore explores the issue of inaccessibility to education and irrelevancy of educational content with the aim of providing necessary recommendations to salvage the system.

Litereature review

Equality of educational opportunities can be regarded as a policy of ensuring no child left behind as regards to educational pursuance (Ogini & Oke, 2022). Children ought to be given equal opportunity to

have access to education and attend school regardless of their parental status, socioeconomic factors, gender, tribe, disability, religion or political affiliation. Each child has to be given chance and opportunity to attend school because this will significantly influence their chances in the labor market, prepare them for democratic citizenship, critical decision making, ethical and healthy lives(Bertoni, 2018). Research shows that there is correlation between education, health, wealth and civic participation. It is as well intrinsically valuable (Fafunwa, 2022).

Several studies have identified different reasons for educational opportunity inequality. Government being the sole controller and provider of education has been identified as one of the factors responsible for inequality of educational opportunity in the country (Okoro, 2022, Olaniyan, 2023). Justice is expected from the side of the government. It requires that government should ensure that all citizens get equal benefits of education regardless of their economic background, ethnicity, gender or disability. However, government has failed in this direction as many remote areas do not get schools that their children can go, disabled children are not duly provided for and the cost of education has shunned many poor people of education (Adejumobi, 2022; Arikewuyo, 2022). In other scenario, government provides better resourced schools to some regions why some areas learn in dilapidated or mushroom classes. Some studies such as (Usman, 2018; Oguniyi, 2022; Fafunwa, 2022) have attributed educational inequality to socio-economic background as poor parents who may not be able to afford school expenses, textbooks, uniform and they therefore divert their students to other life endeavours. Gender based factor is also another factor when some parents deny girls of education believing it has no value to their future career (Usman, 2018; Oguniyi, 2022; Fafunwa, 2022)

Challenges Facing Quality Education in Nigeria

The United Nations Education, Scientific and Cultural Organization (UNESCO) defines quality education as the teaching-learning process that produces knowledgeable, skilled, critical thinkers, creative problem solvers, and lifelong learners (UNESCO, 2017). It is a type of learning that provides students with the right type of knowledge, skills, and values that will enable them to significantly function in society and improve their mental, emotional, social capability leading to personal growth (Oguniyi, 2022). Based on these definitions, every rudiment of quality education is lacking in Nigeria. The reasons are all

encompassing. Some studies such as Adeniran & Okpanachi, 2018; Olaniyan 2023) identified issue of poor-quality assurance in higher institutions, ineffectiveness of teachers (inputs), home, the society, peer group, government and students' attitudes towards learning as the reason for substandard education (Adeniran & Okpanachi, 2018; Fafunwa, 2022; Olaniyan 2023).

Poor quality education or school achievement can also be attributed to poor educational supervision and control, poor funding and inadequate infrastructural facilities (Udoko, 2017; Eli-Chukwu et al, 2023), teacher related challenges such as teacher shortages and inadequate training (Afolabi, 2017), low teacher motivation and morale (Ogunyemi, 2018), limited teacher professional development opportunities (Adeniyi, 2020), inadequate teacher-student ratio (Nwosu, 2019), socio cultural challenges which include Limited parental involvement in education (Adeniyi, 2020), child labor and early marriage (UNICEF, 2019), conflict and insecurity affecting education (Adebayo, 2018) and technology related challenges such as Limited access to technology (Afolabi, 2017), inadequate digital literacy among teachers (Adeniyi, 2020), poor internet connectivity (Ojo, 2020), limited use of technology in teaching and learning (Adebayo, 2018). These cumulative challenges have led to poor outcome of the educational outputs.

Research Questions

The study will address the following research questions

1. Why the need for equality of education?
2. What are the barriers to educational equality?
3. What are the causes of irrelevancy of educational content in Nigeria?
4. What are the solutions to irrelevancy of educational content in Nigeria?

Methodology

This study adopted a qualitative approach, focusing on the analysis and synthesis of existing literature to answer the stated research questions. The study utilized various data sources, including academic journals and articles, books and book chapters, conference proceedings, government reports and policies, non-governmental organization (NGO) reports and online databases and repositories. The data collection involved searching electronic databases, online

libraries, and websites using specific keywords related to the research questions.The data analysis involved a systematic and rigorous process to identify, categorize, and synthesize the existing literature on the inequality of educational opportunity and challenges facing quality education in Nigeria. Relevant data were extracted from different studies using the research questions as a guide.

Results

Research Question 1: Why the need for equality of education?

5. Education is a criterion for job opportunity and a way of reducing unemployment: Education has become a crucial factor in securing job opportunities, and its absence can lead to unemployment. This is supported by various studies (World Bank, 2020; OECD, 2020; International Labour Organization, 2020).

6. Education provides enlightenment on civic responsibility: Education enlightens citizens on their civic responsibilities, fostering patriotism and national development. This is evident in research on global citizenship education (UNESCO, 2019; Council of Europe, 2020).

7. Education refines behavior and contributes to national development: Education refines behavior, enabling citizens to contribute positively to national development and social cohesion. Studies have shown the significance of education in economic development (World Economic Forum, 2020; Brookings Institution, 2020).

8. Education develops talent: Equality of educational opportunities cultivates and develops talents from all sections of the population, promoting overall development. Research emphasizes the importance of inclusive education (UNESCO, 2020; World Bank, 2020)

9. Education enables social mobility and overall welfare improvement: Equality of education enables social mobility, improving overall welfare and reducing social inequalities. Studies have demonstrated the impact of education on social mobility (Brookings Institution, 2020; OECD, 2020).

10. It enables egalitarian society and social equality: Equality of educational opportunities establishes an egalitarian society, promoting social equality and justice. Research highlights the role of education in promoting social equality (UNESCO, 2019; World Bank, 2020)

11.   It helps in removing societal prejudice and bias: Education removes societal prejudice and bias, fostering a spirit of togetherness and social cohesion. Studies have shown the effectiveness of education in promoting social cohesion (UNESCO, 2020; World Bank, 2020)

Research Questions 2: What are the barriers to educational equality?

1. Socio-economic factor- Inequality of educational opportunity occurs due to the poverty and economic disparity. In Nigeria of today, large number of people cannot afford the exorbitant expenses of education, they therefore deny their children education or the children eventually drop out of school due to economic constraints. Children from poor background may also not have access to quality learning due to incapability to purchase necessary materials (Bertoni et al., 2018; National Bureau of Statistics, 2020; UNESCO, 2019).

2. The cost of education is another barrier. The cost of schooling in the country is not affordable for the poor and only privileged and wealthy people have opportunity of sending their children to school. Some public institutions are run like private schools in term of cost. Geometric increase in the tuition fee and lack of financial assistance from the government shun many students off of the school. The effects of the dichotomy in the community is the high rate of thuggery, criminal activities, armed robberies and other social menace. In addition to this, some courses in universities are specially reserved for the children of the wealthy and elite people, either because of the cost required or connection expected. Students from poor backgrounds are then offered courses that may not contribute to their life or are totally irrelevant to the present global economy. The most pathetic aspect is that if government bursary/scholarship is available only these same rich kids get opportunity to get it (World Bank, 2020; Oladele, 2017).

3. Geographical location- Children in rural or riverine areas do study in poorly equipped schools, lack qualified teachers and supervision but have to compete with the children in urban areas where their schools are well-equipped in the national exams such as WAEC, NECO and JAMB. In some of these remote areas no school is available. In fact, majority of the members of Boko Haram and Bandits who unleashed mayhem on the nation are victims of education inequality as some do not

have access to school (Bertoni et al, 2018; African Development Bank, 2020).

4. Cultural or religion belief- Some people do not consider education necessary either due to their cultural or religion ideology. They therefore shun education entirely (UNESCO, 2019; Adebayo, 2019).

5. Gender disparity- There is an ever persisting wide sex disparity in Nigeria. Girls education especially at higher level of education is not similarly encouraged as boys. Some parents do deny girls access to education as they believe it is a waste of resources. The resultant effect is the girl trafficking, baby factory, high rate of prostitution that have become widespread in our country today (Oye, 2016; UNICEF, 2019).

6. Misconceptions about the outcome of schooling- Some people deprive their wards of education because they believe that at the end of the day, students are unable to get white collar job. This is a parochial understanding of educational outcome (Oladele, 2017).

7. Poor implementation of government policy on equality of educational opportunity (Federal Ministry of Education, 2019).

8. Religion affiliation is another factor for inequality of educational opportunity. Nigeria is divided along religion polarisation. Some religion organisations do establish school covering primary to tertiary institutions. However, these faith-based institutions do not give access to people belonging to another faith to gain admission into their schools. This kind of policy has affected lives of many citizens as this faith based institution may be the only one available in that area (Adebayo, 2019).

9. Negligence of the disabled children- The number of schools available for the disabled children is insignificant compared to the population of those who fall into this category. Apart from this, if they eventually have access to attend, the structures of the school built in our country do not consider disabled students. They find it difficult to navigate within the school premises (Obiakor, & Eleweke, 2014). Thus, children with disabilities do shun education due to the inconvenience. Sadly, they are denied equal educational opportunity like others. In a normal circumstance, in developed countries America, Britain, China or even in some developing countries like South Africa, Malaysia, students or staff with motion impairment have special walkways which make it easy for them to climb the staircase for any activity. They do have unique car parking spaces for those

of them with cars. However, this special consideration and provision are lacking in most of Nigerian institutions.

10. Inequality of education due to cultural differences. The most pronounced form of education in the Southwest and eastern part of the country is western education while the northern part of Nigeria focuses more on Islamic education (Sebastine et al, 2015). However, the graduates from the former can easily get government job and become well to do while the latter is not formally recognised. Then, the idea of no to education arises. To create equal opportunity, both have to be recognised, supported even if modifications will be done. This will help in reducing number of unemployment, insecurity, banditry and others (Sebastine et al, 2015; World Bank, 2020).

Research Question 3: What are the causes of irrelevancy of educational content in Nigeria?, 2019).

1. Inadequate budgetary allocation/under funding: Quality education can only be achieved through adequate financial support as infrastructural and manpower needed are all dependent on fund available. United Nations (UNESCO) has stipulated that all countries should allocate 26 percent of their budgetary allocation for to education in order to increase education accessibility (UNESCO, 2019). A cursory look at national budget allocation for education shows that Nigeria falls short of the threshold. The shortage of funds has led to deficiency in the number of staff, poor infrastructural facilities, poor research, ill equipped library, lack of development in ICT and problem of novelty and creativity (Afolabi, 2020).

2. Poor Teachers Remunerations: Salary and other entitlements given to teachers are so meager that teachers are unable to meet ends meet. This does not only demotivate them but also affect their productivity (Oladele, 2017). The most pathetic part is that this meager payment is not paid regularly, most times, teachers have to go on strike to demand for their due. Teachers have problem in getting regular promotion as at when due, even when they do, it is sometimes tagged promotion without pay long as this persists, no quality or relevant education will be expected. Due to this, teachers have been demoralised in providing their best for the students learning. They exhibit lackadaisical attitude in the school and extral effort needed from them to support the

students academic is not provided (Adeniyi, 2022). According to the findings of quality or relevant education is only guaranteed when teachers contribute both formal and informal or extral role in the school.

3. Policy Summersault and Inconsistency in Educational Programme: Flexibility and change are novelty but ability to sustain and maintain the change process is more important. Different educational policies have been made in the country but they are abruptly neglected with no proper evaluation of what has been achieved or challenges faced during the implementation. The UPE programme hitherto adopted was not evaluated before the new UBE was announced (Daura & Audu, 2015).Each political dispensation has one unique idea and ideal with no recourse to the policy on ground. 2009 agreement that Jonathan administration made with ASSU was rejected by the new government. Hence, the process of the negotiation begins afresh. In the face of this policy inconsistence in the country, quality education will be eroded and tutors who will make the learning relevant will lose enthusiasm and interest in meaningful teaching (Adebayo, 2019

4. Poor Infrastructural Facilities: Nigerian schools, primary, secondary and tertiary institutions are faced with ill-equipped libraries, teaching materials and laboratories, if at all they are available. Students in some schools learn under dilapidated buildings, sit on bare floor because of unavailability of chairs and tables, playfields, school farms, computers, workshops for practical training are all things of past. In tertiary institution, institution revitalization has always been the bone of contention between ASSU and the government and reason for the incessant strikes. Quality or relevant education dependends on the availability of infrastructural facilities, what quality will be given to science students with no laboratory or equipment, how can leaning be relevant to students who learn mechanical or computer engineering without workshop, of what relevant is theoretical knowledge without practical (UNICEF. 2019)

5. Corruption: The bane of Nigerian society has been identified as corruption, greediness and avarice. Institutions of learning are not excluded in this plague. Funds allocated to educational sectors either from the local, state or federal government are being embezzled, syphoned, mismanaged or diverted. Minister, Vice Chancellors, principals, and

headmasters are all found culpable in the act. Admission racketeering is another manifestation of corruption in Nigerian educational institutions, qualified students are sometimes denied admission because they lack 'back up and godfather (World Bank. 2020). As long as this continues the premise or foundation upon which quality and relevant will be built is shallow already. Apart from institutions of learning, educational agencies JAMB, NUC, TESCOM, SUBEB shouldered with responsibility of ensuring quality and relevant education are also guilty of the ungodly act, not long ago we heard bizarre news of snake swallowing educational fund from JAMB office (UNICEF, 2019).

6. Lack of Patriotism and Professionalism among Teachers: Sacredness of teaching profession is being desecrated by many a teacher including professors. At the lower level, teachers employed to teach left the students unattended to and engage in petty trading during the school hours. At the upper level, often we hear sex for grades from those that the nation handed over the future of our next generation to. Lackadaisical attitude to work, engaging in examination malpractice, poor teaching methods and other unprofessional acts characterized our professionals in the citadels of learning. Poor and unserious students can get undeserved mark as long as they know how to get their ways (Sebastine, 2015)

7. Parental factor: There is poor parental care generally in the society. Some children in the school are ill-mannered, pampered by their parents and thus making the duty of teachers more tedious. Many parents come to school to deal with teachers because they dear beat their beloved sons and daughters (Bertoni, 2018). Sometimes, parents pressurize school management to give double promotion to their undeserved children and arrange machinery to help their children in the examinations. At the other hand, some poor parents fail to provide necessary materials for their wards making comprehension of lessons taught more difficult(Adeniyi, 2022)

8. Poor Supervision:- Unlike in the olden days, there is no proper supervision for teaching activities again in our schools. When it is done, it is a merry making affair between the supervisor and teachers. Of course, supervisors come for entertainment and every activity met is satisfactory. No comment for improvement (Oye. 2016)

9. Curriculum Mismatch:- Despite efforts made in indigenizing educational curriculum, there is still a lot to do as most of contents in our curriculum are still alien to our immediate environment. Contents in the Science subjects, especially, are not driven from immediate environment making the subjects a frightful one for the students Fafunwa, 2020)

10. Insufficient Funding for Research:- Research funding enables innovation, but Nigerian educational institutions struggle to secure funding (UNESCO, 2019).

11. Lack of Technology Integration:- The integration of technology in education enhances learning outcomes, but Nigerian schools lack adequate technological infrastructure, limiting students' access to digital resources (Adebayo, 2019).

12. Inadequate Teacher Training:- Teachers require continuous training to stay updated on best practices, but opportunities for professional development are scarce (Oladele, 2017).

13. Poor Student-Teacher Ratio:- Overcrowded classrooms hinder effective teaching and learning (Bertoni et al., 2018).

Research Question 4: What are the solutions to challenges facing quality education in Nigeria?

1. Increase in the investment in Education: Shortage of fund is at the forefront of educational challenges in the country. Quality education and effective learning can never be achieved if sufficient resources is not allocated in the national budget for educational sector. Government should therefore increase educational allocation in the budget. Government should also woo both local and international investors to support government efforts (Brookings Institution. (2020).

2. Curriculum Reform: Most of the course content in Nigerian citadels of learning are bequeathed to us by the colonial master making it alien to our indigenous environment. Thus, as a way forward, government should create a committee to review the curriculum to suit the indigenous needs and ensure it is embedded with the appropriate skills and competencies required in the contemporary society.

3. Teacher Training and Development: The teacher training program needs to be upgraded and reformed. Soft skills, ICT, leadership and other twenty first century skills have to be included in the program. This will serve as capacity building for our various educators (UNICEF, 2020).

4. Public-Private Partnerships: Nigeria government can adopt PPP strategy to develop educational sectors. Government can collaborate with different stakeholders in the ownership, management and coordination of schools so that there will be effective monitoring, supervision and efficiency. This partnership can be with Alumni, Parents, investors or company. This will actually solve supervision problem that has been the bone of effective teaching and learning in our schools.

5. Public enlightenment and stringent policy: Parents have to be enlightened on the negative consequences of rushing their students academic pursuits beyond their age and mental capacity. Nigeria government, like Finland, should make stringent policy on the age a student should be in a class or sit for national exam, this will help in solving students inability to learn effectively due to the age related factor which affects the quality of education received.

6. Financial and moral incentives: All efforts to salvage educational sector and improve learning will be in jeopardy and wasted if teachers are not well cared and catered for. The economy reality shows that government has to improve teachers' and lecturers' welfare. Salary needs to be paid on time and fringe benefits and bonuses have to be given to them to boost their morale. The national awards given to some rich or influential people in the country has to be extended to outstanding tutors in the country, this will serve as incentives and encourage people who have lost interest in the teaching job.

7. Creation of corruption free environment - Embezzlement or mismanagement of educational fund, awarding undue grades to students due to favouritism, lackadaisical attitude in the school, admission racketeering and other unethical practices in the school should be seriously dealt with. This can be done by awarding different punishments for the offences ranging from sacking, demotion and even jailing. This will deter culpable personnel and will cleanse our educational sector from the mess(Adeniyi, 2022)

Recommendations

The following points are general recommendations for expanding educational access and ensuring quality education:

1. Government should make inclusive education policies that will address disparities and promote equal access to

education regardless of ethnic or religion affiliation, socioeconomic status or disability. The policy should ensure everyone has access and is entitled to quality education without any hindrance or disturbance (UNESCO, 2020).

2. Introduction of nomadic education programme to take care of the cattle rearers' children or children living in riverine areas. This will help in curbing menace of banditry, kidnapping and even farmer-herders crisis in the country.

3. Creation and disbursement of special allocation to educational backward or disadvantaged states in order to catch up and correct the imbalance

4. Introduction of student loan so that students from poor background can successfully pay their dues

5. Creation of adult education program so that adult literacy will be achieved in the country. This should cover all the grassroots if the country. The initiative will ginger patriotism, improve economic welfare, health care and political participation.

6. Effective supervision of education should be timely conducted in the rural areas and qualified teachers should be provided for them.

7. Content of education should be reviewed to match indigenous environment and suitable for the current economic situation in order to become an appealing one to the students

8. Free online learning (youtube, social media,TV and radio) should be created and provided by all higher institutions in the country

9. Punishment should be melted on any institution or individual that engages in any discrimination policy that erode the right of equality from the weaker sections of the society

10. Sincere efforts should be made to provide compulsory education to all the children

11. Scholarship should be provided in lieu of loan from primary to higher education level on merit

12. Education should be made tuition free from primary and secondary levels

13. Free text books and writing materials should be supplied at the primary and secondary stage

14. Other financial assistance such as free transport and hostel can still be added to make education more cheaper

15. State and local governments should also provide bursary to the student from various constituencies.
16. Enlightenment of public on the advantages acruable from educational pursuance.
17. Free or subsidized education should be given to the disabled, less privileged people and disadvantaged communities.
18. Incentives should be allotted to teachers teaching in the remote or riverine areas to encourage teaching personnel teaching there and entice others.
19. Federal and state government can pay the WAEC or NECO fee so that students who drop out because of the exam fee can be assisted.
20. Loan without interest can be provided to students in higher institutions of learning. This will encourage massive enrollment and put a stop to the rate of drop out.
21. Develop Al majiri system of education in such a way that the students from these schools can learn formally, have access to school materials, uniform and food. Vocational training should be added so that graduates from this system can fend for themselves and be useful to the community.

Conclusion

Education is undoubtedly the vehicle for eco-social development at national level and is a vital catalyst for individual growth. Every citizen should therefore be given opportunity to have access to it. For education to adequately achieve its purpose, quality teaching and learning must be provided. In Nigeria certain factors hinder both equality of educational opportunity and quality education. This paper has succinctly identified the challenges hampering both issues and way forward of overcoming these obstacles have been provided. It is believed that if these challenges are adequately and strategically addressed, transformative power of education in unlocking both individual and national potentials will blown out and the country will witness unprecedental development in economic, social, political and all the sectors in the country.

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Home Environment and Students' Academic Achievement in Nigerian Senior Secondary School Physics

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Abstract

This study examined the influence of home environment on physics students' academic achievement in Ondo West Local Government Area of Ondo State, Nigeria. Expost-facto research design was adopted for the study. Two hundred (200) senior secondary two (SS2) physics students were used for the study. Multistage sampling technique comprised of stratified and simple random sampling techniques was used to select schools and students. The instruments used in collecting data were Home Environment Questionnaire (HEQ) and physics Achievement Test (PAT) with reliability coefficients of 0.86 and 0.79 using Cronbach alpha and Kuder Richardson formular 21 respectively. The data collected were analyzed using t-test, Analysis of Variance (ANOVA) and multiple regression analysis. The results showed that, parents' educational status (PES) is the highest contributor to students' achievement in physics (β=.487; t=32.87*; p=.000). This is seconded by parents' socio-economic status (PSS) (β=.385, t=29.36*; p=.000), followed by parents' motivational levels (PML) (β=.313; t=24.18*; p=.000), followed by school location (SL) ((β=.276; t=11.24*; p=.000) while types of school (TS) (β=.217; t=5.43*; p=.000) is the least facilitating students' achievement in physics. It is recommended among others that, parents should create a good and conducive learning environment for their children, provide necessary facilities that can stimulate learning at home by giving them necessary attention and guidance, and give them rewards when they excel in their academic achievement in school.

Keywords: Home Environment, Parents' Motivational levels, Parents' Socio-economic Status, Parents' Educational Status, School Location, Types of School

Introduction

The home is the basic place that provides the child with primary socialization and laying the fundamental education background for the child upon which the other agents of socialization are built. The learning environments include; the home, the school and the society where the child operates (Akinbobola, 2010). Education received by a child from guardians or parents at home is most likely to have significant impact on the behaviour of the child later in life (Bada & Akinbobola, 2022).

Slaughter and Epps (2012) refer to home environment as the characteristics of society components formed by members of the

family, living together in a particular area and perform duties that are related to the activities of the family. The home environment as the immediate social environment of the child refers to as the ecology of child development. Ecology of human development is the scientific study of the progressive mutual interaction between an active developing human being and the changing features of the immediate environment in which the developing individual lives.

The home environment is the nature of the child's cognitive, emotional and social care inside the home and represents the child's psychological environment. The home setting is part of the society that determines the development and performance of the students in school and also refers to the knowledge, actions and behaviours that will lead them into a good and effective students (Ghalth, 2020). The home environment determines a lot about the child's self-development, self-concept and self-esteem. Hence, parents should take proper care, so that wrong concept or values are not inculcated in their lives. A child who develops wrong concept at home may exhibit poor academic achievement if the school cannot change the ill-manners developed at home (Akinbobola & Adedayo, 2010; Kham, Begum & Imad, 2019).

Home environment is the combination of psychological and physical environment. The psychological environment of home includes the mutual interactions of family members, respect, contribution to family matters and uphold the norms and values of the family. The physical environment includes physical needs of the individuals such as food, clothes, shelter, rooms, water and electricity. Both psychological and physical environment influence the overall development of individuals (Oommen, 2015). The future of the child is determined by his home environment. This is in accordance with the aim of pre-primary education which states that, parents should be able to effect a smooth transition from home to school. This implies that, children should have adequate preparation at home before moving to their levels of education (Federal Republic of Nigeria, NPE, 2014). The question is how many homes can offer effective transition of children from home to school? This is because of the differences in home environment factors such as motivational level, school location, types of school, parents' educational status and parents' socio-economic status.

Parents' motivation to encourage their children to learn science, especially physics can be a great factor in academic success. When parents value and actively promote the learning of science, children

are more likely to be interested in physics and perform well in school. Motivation from parents can come in different forms, such as enrolling children in schools that offer quality science instruction and providing instructional resources that enhance science learning (Saka, Akinbobola & Olorunfemi, 2024).

Children are more likely to exhibit motivation to learn when their parents or teachers are pleasant, sympathetic, show understanding and well organized. A child's responsiveness to development to which education exposes at home depends not only on his capacity but on environment, opportunity and parents' encouragement (Akinbobola & Osu, 2007)

The level of motivation of parents is a major determinant of the child's overall acquired intellectual ability. They normally monitor their children's academic activities and make sure that the do their home assignment given to them at school (Saka, Akinbobola & Saka 2023).

School location is also a major factor which can affect students' academic achievement because there exist some relationships between the learning process and the learning environment which is in a way related to the location of school Oredein (2016) defines school location as the immediate environmental conditions of a school, which may be either rural or urban. Also, Okorie and Ezeh (2016) define school location as a particular area in the physical environment, whether urban or rural, where the school is cited. Oredein (2016) states that, while human beings have an unlimited capability for learning, this potential can be constrained by the bahaviours and facilities provided by their immediate environment. However, whether rural or urban, the science environment constitutes the laboratory, adequate materials, adequate manpower (qualified science teachers) and peer group (Akinbobola, 2015).s

In this context, rural areas refer to villages and areas far from the local government headquarters and lack basic infrastructural facilities. Urban areas on the other hand refers to areas within the local government headquarters with basic infrastructural facilities such as electricity, bore holes water supply and tarred road (Lanre-Babalola et al., 2023).

In Nigeria, secondary education is classified into private and public schools. Public secondary schools are established by communities, state and federal government with the approval of their respective state authorities (Lanre-Babalola et al., 2023). These schools are

managed by government agencies, such as teaching service commission. public secondary schools in Nigeria are further classified into unity schools, which are managed by the federal government and state schoolss, overseen by state governments (Nwajagu, 2022). On the other hand, independent schools also known as private secondary schools are established by non-government organizations. Voluntary agency schools and mission schools mainly focus on humanitarian and social objectives, whereas purely private schools are, primarily operated as profit-oriented enterprises (Mwajagu, 2022). The rise of private schools offer alternatives, but the high-cost limits access for poorer families, who often depend on public schools (Anchunda, 2023). Nonetheless, both public and private schools are expected to meet national educational goals, with the final examinations serving as a major measure of school effectiveness (Eze, Ezenwafor & Obidile, 2016).

Education of children starts at home and continues in school through the efforts of a teacher. A child's responsiveness to development, which education exposes him depends not only on his inbuilt nature, but on the environment, opportunity and parents' level of encouragement. Literate parents re-enforce their children's education from pre-school years. Also, the skills acquired through education has been extended to their children. Therefore, parental education and the type of occupation they are doing serve as strong determinants to a child's academic achievement at all levels of education. (Akinbobola, 2010; Bakar, Mamat & Ibrahim, 2017; Onyedikachim & Ezekiel -Hart, 2021).

Parental educational level is the highest level of education achieved by parents. It includes a wide range of levels, from primary school to professional. The educational attainment of parents has been considered as one of the reliable indicators of many sociological and psychological factors that affect the academic achievement of children (Akinbobola, 2010;

Ahmed & Anwar, 2013; Onyedikachim & Ezekiel-Hart, 2021). Well-educated parents can offer valuable guidance to their children, drawing from their own educational experiences and knowledge which will be of great benefits to their children. These include provision of relevant instructional materials for science practicals, textbooks, and conducive learning environment for their children (Akinbobola, 2010; Chohan & Khan, 2010; Bakar, Mamat & Ibrahim, 2017). Students with parents who possess higher levels of education may exhibit a

greater appreciation for learning more optimistic ideas about their abilities, a stronger inclination towards efforts, and more efficient learning practices compared to students whose parents have lower levels of education (Onyedikachim & Ezekiel-Hart, 2021).

Rodriguez-Hernandez, Cascaller and Kyndt (2019) states that, socio-economic status has influence on students' academic achievement. Parents contribute directly to the educational process of their children by monitoring and helping them in their school work and by providing information and experience supplement those their children do receive in schools. In some societies, there is no strict division of these social classes, the classification of income of parents is still low income, middle income and high income. Family income affects wide variety of valuables, higher income which is associated with better nutrition from childhood, greater education opportunities, higher intelligence and more motivational opportunities, higher intelligence and more motivation to work (Chubaienla & Imsutula, 2022)

Families with low income earning or background may find it difficult to provide for their children. The inability of parents to provide basic needs of their children in school may likely cause a gap in the achievement of students in physics. This is because students are required to bring textbooks, practical material, tools and equipment for laboratory use. On the other hand, families with high income earning are likely to provide both financial and materials supports to their children to ensure their progress in school (Akinbobola, 2009).

Statement of the Problem

There is no gain saying the fact that, poor achievement of students in their examination is an issue stakeholder in education are contending with today, most especially in physics. This unsavoury and uncouraging situation has been attributed to diverse factors, such as students' home environment, students' commitment to studies, parental attitude towards their children academic pursuits and poverty, especially, the present state of economy of the country which has led to hardship which may likely affect the students' achievement in physics. Hence, what is the influence of home environment on students' academic achievement in senior secondary school physics?

Objectives of the Study

The purpose of the study is to examine the influence of home environment on secondary school students' achievement in physics in Ondo West Local Government Area of Ondo State. Specifically, the study is design to achieve the following objectives:

1. To find out the influence of parents' motivational level on students' achievement in physics.
2. To assess the influence of school location (urban and rural) on students' achievement in physics.
3. To determine the influence of types of school (private and public) on students' achievement in physics.
4. To ascertain the influence of parents' education status on students' achievement in physics.
5. To investigate the influence of parents' socio-economic status on students' achievement in physics.
6. To examine the relative influence of independent variables of parents' motivational level, school location, type of school, parents' education status and parents' socio-economic status on students' achievement in physics.

Hypotheses

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

1. There is no significant difference in the mean achievement score of physics students with high and low parents' motivational levels.
2. There is no significant difference in the mean achievement score of physics students from urban and rural schools.
3. There is no significant difference in the mean achievement score of physics students from private and public schools.
4. There is no significant difference in the mean achievement score of physics studentss whose parents are of low, average and high educational status.
5. There is no significant difference in the mean achievement score of physics students whose parents are of low, medium and high socio-economic status.
6. There is no relative significant influence in the independent variables of parents' motivational level, school location, types of school, parents' educational status and parents' socio-economic status on students' achievement in physics.

Methodology

Ex-post facto research design was adopted for the study. The population of the study consisted of all the senior secondary two (SS2) students in the forty-two (22 public and 20 private, 32 urban and 10 rural) secondary schools in Ondo West Local Government Area of Ondo State. The sample size of the study consisted of two hundred (200) students. Multistage sampling technique was used for the study. The first stage was the use of stratified random sampling technique to select the schools. The two strata are urban and rural schools. Four (4) secondary schools were selected from each stratum. That is, eight (8) secondary schools were used for the study. The second stage was the use of simple random sampling technique to select two (2) public schools and two (2) private schools from each stratum through balloting. Also, twenty-five (25) students were randomly selected from each school, making a total of two hundred (200) students used for the study.

Home Environment Questionnaire (HEQ) and Physics Achievement Test (PAT) were the instrument used to collect data for the study. HEQ consisted of two sections, A and B. Section A sought information on demographic data such as student's age, gender, class, types of school, school location, parents' educational status, and parents' occupation. Section B sought information on parents' socio-economic status and parents' motivational level. The items were constructed with four option responses of Always, Often, Rarely and Never, with the rating scale of 4,3,2 and 1 respectively for positive statement. PAT consisted of fifty (50) multiple choice items on the concept of electricity. Each item had four (4) options (A, B, C, & D) with only one correct answer.

The instruments were validated by two (2) physics educators, two secondary school physics teachers, a guidance counsellor and an educational psychologist. To further strengthen the validity, the instruments were administered to a trial testing group of fifty (50) students who were not part of the main study. The results obtained in the administration of HEQ were subjected to Cronbach Alpha while the results obtained from the administration of PAT were subjected to Kuder Richardson formular -21. The results showed reliability coefficients of 0.86 and 0.79 for HEQ and PAT respectively. The administration of the instruments was done in the selected schools through the help of physics teachers (research assistants) in each school. Students whose parents have West African Senior Secondary

School Certificate (WASSSC) and below were classified as low education level; holders of National Diploma (ND) and Nigeria Certificate in Education (NCE) were classified as average (medium) education level while those who has Higher National Diploma (HND), First Degree and above were classified as high education level. Also, students whose parents' income is less than N100,000 per month were classified as low socio-economic status, between N100,000 and N250,000 were classified average socio-economic status while those who received more than N250,000 were classified as high socio-economic status. The data collected were analysed using t-test, Analysis of Variance (ANOVA) and multiple regression analysis. All the hypotheses were tested at 0.05 level of significance.

Results

Hypothesis One: There is no significant difference in the mean achievement score of physics students with high and low parents' motivational levels.

The analysis is as shown in Table 1.

Table 1: t-test analysis of the man achievement score of students based on parents' motivational level

Motivation Levels	N	X	SD	Df	t-cal.	Sign.	Decision at p<.05
High	118	76.24	5.96	198	24.18	.000	*
Low	82	54.72	6.34				

* Significant at p<.05 alpha level

The analysis in Table 1 shows that, the main effect of parents' motivational levels on students' achievement in physics was significant ($t(198) = 24.18^*$, p=.000). Therefore, the null hypothesis stating a non-significant difference in the mean achievement score of physics students with high and low parents' motivational levels was rejected. This implies that, there is a significant difference in the mean achievement score of physics students with high and low parents' motivational levels. The table also indicated that, students with high motivational level achieved significantly better than students with low motivational level.

Hypothesis Two: There is no significant difference in the mean achievement score of physics students from urban and rural schools.

The analysis is as shown in Table 2.

Table 2: t-test analysis of the mean achievement score of physics students based on school location

School Location	N	X	SD	Df	t-cal.	Sign.	Decision at p<.05
Urban	100	74.48	7.64	198	11.24	.000	*
Rural	100	62.16	7.16				

* Significant at p<.05 alpha level

As shown in Table 2, the main effect of school location on students' achievement in physics was significant (t (198) =11.24*; p =.000). Therefore, the null hypothesis stating a non-significant difference in the mean achievement score of physics students from urban and rural schools was rejected. This implies that, there is a significant difference in the mean achievement score of physics students from urban and rural schools. The table also indicated that, students from urban schools achieved significantly better that students from rural schools.

Hypothesis Three: There is no significant difference in the mean achievement score of physics students from private and public schools.

The analysis is as shown in Table 3.

Table 3: t-test analysis of the mean achievement score of physics students based on types of school

School Location	N	X	SD	Df	t-cal.	Sig.	Decision at p<.05
Private	100	71.62	7.72	198	5.43	.000	*
Public	100	65.12	7.46				

* Significant at p<.05 alpha level

As shown in Table 3, the main effect of types of school on students' achievement in physics was significant (t (198) = 5.43*, p=.000). Therefore, the null hypothesis stating a non-significant difference in the mean achievement score of physics students from private and public schools was rejected. This implies that, there is a significant difference in the means achievement score of physics students from private and public schools. The table also indicated that, students from private schools achieved significantly better than students from public schools.

Hypothesis Four: There is no significant difference in the mean achievement score of physics students whose parents are of low, average and high educational status.

The analysis is as shown in Table 4.

Table 4: One – way Analysis of Variance (ANOVA) of the mean achievement score of students based on parents' educational status

Source of Variation	Df	Sum of Square	Mean Square	F-cal.	Sig.	Decision at p<.05

Between groups	2	13167.76	6583.88	235.81	.000	*
Within groups	197	5499.23	27.92			
Total	199	18666.99				

* Significant at p<.05 alpha level

As shown in Table 4,   the main effect of parents' educational status on students' achievement in physics was significant (F(2) 197) = 235.81*; p=.000). Therefore, the null hypothesis stating a non-significant difference in the mean achievement score of physics students with parents of low, average and high educational status was rejected. This implies that, the three levels of educational status (high, average and low) differ significantly in their enhancement of the academic achievement in physics.

To find the direction of significance under investigation, the achievement scores were subjected to Scheffe multiple comparison test for a post hoc analysis as shown in Table 5.

Table 5: Results of Scheffe's post hoc test for multiple comparison of parents' educational status on students' achievement in physics

Dependent Variable: Achievement Score

(I) Educational Status	(J) Educational Status	Mean Difference (I-J)	Std. Error	Sig.	95%Confidentce Interval Lower Bound	Upper Bound
High	Average	10.04*	.78	.000	4.53	10.04
	Low	19.61*	.84	.000	14.43	10.74
Average	High	-10.04	.78	.000	-10.04	-4.53
	Low	8.56*	1.12	.000	1.36	1.26
Low	High	-19.61*	.84	.000	-10.74	-14.43
	Average	-8.56*	1.12	.000	-1.26	-1.36

*=the mean difference is significant at the .05 level

As shown in Table 5, the mean difference between high and average was 10.04; between high and low was 19.61; and between average and low was 8.56.

This implies that, physics students with parents of high educational status significantly achieved better than physics students with parents of average educational status, which in turn achieved significantly better than physics students with parent of low educational status.

Hypothesis Five: There is no significant difference in the mean achievement score of physics students whose parents are of low, medium and high socio-economic status.

The analysis is as shown in Table 6.

Table 6: One-way Analysis of Variance (ANOVA) of the mean achievement score of students based on socio-economic status

Source of Variance	Df	Sum of Square	Mean Square	F-cal.	Sig.	Decision at p<.05
Between groups	2	13110.63	6555.32	229.37	.000	*
Within groups	197	5630.96	28.58			
Total	199	18741.59				

*= significant at p<.05 alpha level

As shown in Table 6, the main effect of parents' socio-economic on students' achievement in physics was significant (F(2,197),=229.37,p=.000).; Therefore, the null hypothesis stating a non-significant difference in the mean achievement score of physics students whose parents are of low, average and high socio-economic status was rejected. This implies that, there is a significant difference of the mean achievement score of physics students whose parents are of low, average and high socio-economic status.

To find the direction of significance under investigation, the achievement scores were subjected to Scheffe multiple comparison test for a post hoc analysis as shown in Table 7.

Table 7: Results of Scheffe's post hoc test for multiple comparison of parents' socio-economic status on students' achievement in physics

(I)Socio-economic Status	(J)Socio-economic Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Lower Bound	Interval Upper Bound
High	Average	10.00*	1.20	.000	4.28	10.00
	Low	19.64*	1.21	.000	13.25	19.72
Average	High	-10.00*	1.20	.000	-10.72	-4.28
	Low	8.53*	1.21	.000	4.63	11.26
Low	High	-19.64*	1.21	.000	-19.72	-13.25
	Average	-8.53	1.21	.000	-11.12	-4.63

Dependance Variable: Achievement Score

*=the mean difference is significant at the .05 level

As shown in Table 7, the mean difference between high and average was 10.00; between high and low was 19.64; and between average and low was 8.53. This means that, high socio-economic status was the most effective in facilitating students' academic achievement in physics. This was followed by average socio-economic status while low socio-economic status was seen to be the least effective in facilitating students' academic achievement in hysics.

Hypothesis Six: There is no relative significant influence of the independent variables of parents' motivational level, school location, types of school, parents' educational status and parents' socio-economic status on students' achievement in physics.

The analysis is as show in Table 8.

Table 8: Relative influence of independent variables on students' achievement in physics

Predictor Variable	Unstandardized Coefficient Beta(β)	Standardized Coefficient		Rank Sig.		t
		Std. Error	Beta (β)			
(Constant)	.601	3.443				.000
Parents' Motivational Levels (PML)	.381	.047	.313	3rd	24.18*	.000
School Location (SL)	.315	.041	.276	4th	11.24*	.000
Types of School (TS)	.263	.030	.217	5th	5.43*	.000
Parents' Educational Status (PES)	.530	.024	.487	1st	32.87*	.000
Parents' Socio-economics Status (PSS)	.427	.058	.385	2nd	29.36*	.000

*=Significant at p<.05 alpha level

Table 8 shows that the relative contribution of each of the predictor variables on the dependent variable. Influence of parents' motivational levels (PML) on students' achievement in physics was significant (β=.313; t=24.18*; p=.000), while that of school location (SL) on students' achievement in physics was also significant (β=.276; t=11.24*; p=.000). Also, the influence of types of school (TS) on students' achievement in physics was significant (β=.217; t=5.43*; p=.000), while that of parents' educational status (PES) on students' achievement in physics was also significant (β=.487, t=32.87*; p=.000). The influence of parents' socio-economic status (PSS) on students' achievement was also significant ((β.385, t=29.36*; p=.000).

Thus, parents' educational status is the highest contributor to students' achievement in physics. This is seconded by parents' socio-economic status, followed by parents' motivational levels, followed by school location while types of school is the least facilitating students' achievement in physics. Therefore, the null hypothesis stating a non-significant influence of the independent variables of parents' motivational level, school location, types of school, parents' educational status and parents' socio-economic status on students' achievement in physics was rejected but at different levels as shown in Table 8.

Discussion

The results of hypothesis one indicated that, students with high motivational level achieved significantly better that students with low motivational level. This might be due to the fact that, motivational activities such as rewarding high academic achievement, assisting with assignments, encouraging home study, providing learning materials, offering social amenities, understanding their children's strengths and weaknesses, giving academic and career advice, regularly visiting schools, providing healthcare, discussing academic progress, attending parent-teacher association meetings, and paying school fees on time enhance students' achievement. The results in in consonance with the findings of Deplanty, Coulter-Kern and Duchane (2007), and Rogo and Adamu (2021) that, parents' motivational level exerts a great influence in the academic achievement of students.

The results of hypothesis two showed that, students from urban schools achieved significantly better that students from rural schools. This might be due to the fact that, urban schools have more relevant instructional resources (human and non-human resources) than their rural counterparts. The results is in line with the findings of Okorie and Ezeh (2016) and Akinbobola (2018) that, students whose schools are located in urban score better than those in the rural area.

The results of hypothesis three indicated that, students from private schools achieved significantly better than students from public schools. This might be due to the fact that, public schools are characterized by factors such as insufficient facilities, inadequate qualified teachers, overcrowded classrooms and inadequate teaching resources. The results is in agreement with the findings of Akinbobola and Bada (2019), and Anchunda (2023) that, private schools are equipped with modern facilities and have sufficient staff.

The results of hypothesis four showed that, physics students with parents of high educational status significantly achieved better than physics students with parents of average educational status, which in turn achieved significantly better than physics students with parents of low educational status. This might be due to the fact that, educated parents offer intellectual, financial, emotional and psychological support to their children, helping them feel more comfortable and better adapted to the learning environment which ultimately leads to higher academic achievement. The result is in agreement with the findings of Akinbobola (2010), and Ahmad and Anwar (2013) that, children from families with less-educated parents generally achieve

worse academically in school compared to those with more educated parents.

The results of hypothesis five indicated that, high socio-economic status was the most effective in facilitating students' academic achievement in physics. This was followed by average socio-economic status while low socio-economic status was the least effective in facilitating students' achievement in physics. This might be due to the fact that, higher income is associated with better nutrition from childhood, greater educational opportunities, higher intelligence, and more motivation to work and achievement. This is in agreement with the findings of Faaz and Khad (2017), and Chubaienla and Imsutula (2022) that found a strong positive link between socio-economic status and academic achievement in their study.

The results of hypothesis six indicated that, there is relative influence of the independent variables of parents' motivational level, school location, types of school, parents' educational status and parents' socio-economic status on students' achievement in physics but at different levels.

Conclusion

This study indicated that, parents' educational status (PES) is the highest contributor to students' achievement in physics (β=.487; t=32.87*; p=.000). This is seconded by parents' socio-economic status (PSS) (β =.385, t=29.36*; p=.000), followed by parents' motivational level (PML) (β=.313; t=24.18*; p=.000), followed by school location (SL) (β=.276; t=11.24*; p=.000) while types of school is (TS) (β=.217; t=5.43*; p=.000) is the least facilitating students' achievement in physics.

Recommendations

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

Parents should endeavour to create a good and conducive learning environment for their children at home by avoiding frequent quarrels, promotion of parent-child relationship, providing good seat for study and learning materials for children at home. Also, parents should endeavour to encourage and motivate their children by giving them attention when they are at home, assist them when they are doing their homework, provide necessary facilities that can stimulate

learning and give them rewards when they perform well in school. Parents, government, and non-governmental organizations (NGOs) should help in funding rural schools and also provide adequate facilities to public schools which are situated in the rural areas. Also, scholarship should be given to students from low socio-economic background.

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Financing Primary Education for Sustainable National Development in Nigeria: A Review of Challenges and Way Forward

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Abstract

This paper examines the need for proper funding of primary education in Nigeria for achieving sustainable national development. The paper illustrates that if adequate funding is provided towards primary schools, quality primary education would be derived thereby promoting human capital development, social equality, social cohesion, health well-being and environmental Sustainability. However, the paper explores some key challenges that serve as a stumbling block to achieving proper funding process and these include inadequate government allocation to education, corruption and mismanagement, socio-economic factors, infrastructural deficiencies, as well as teacher shortages and training. These would continue to deter the actualization of the desired development until they are fully overcome. Due to this, the paper recommends that the government should increase its budgetary allocation to education, combat corruption, enhance community involvement, enhance public-private partnerships, address the infrastructural needs, and also improve teacher training and retention. If these are done, primary education in Nigeria will gear towards achieving the sustainable development goals in the country.

Keywords: Funding, Primary, Education, Sustainable, Development

Introduction

The fact is undeniable that education is a key to the development of any nation. Based on this, United Nation Educational, Scientific and Cultural Organisation (UNESCO) advocated the need for the developing countries to dedicate at least 26% of its national budget to maintain, sustain and develop education (UNESCO, 2020). In spite of this provision, funding primary education in this country is not something to write home about such that even the nation herself lacks confidence in the basic education leading to the secondary and

tertiary level education. Owoye, (2010) observed that the objectives of education in this country represent country's statement of intension regarding what aspect of social, economic and political needs and aspiration should be addressed by the education system. A review of the country's past revealed that the role of the basic education has always not been appreciated in spite of loud articulation of the desired objectives and that all the initiatives introduced have been poorly implemented due to several factors including unsustainable funding.

The financing of education is at the heart of the educational crisis in many countries. In Nigeria, it appears to be a perennial crisis of funding and lack of definite structures and mechanisms in funding education, especially basic education manifestations of poor funding that is manifested in unpaid teachers' salaries, inadequate school infrastructure and equipment, dilapidated buildings and lots more (Falalu, 2020). This makes the effective management of the basic education system a herculean task for the administrators and when things get to a head, the teachers revolt leading to strikes and demonstrations.

Conceptual Clarifications

Primary education typically refers to the first stage of formal education for children, usually starting at around the age of five or six and lasting for six to eight years (UNESCO, 2021). It focuses on foundational skills such as literacy, numeracy, and basic science, and aims to provide children with a strong educational base for their future learning and development.

Munasinghe (2004) viewed sustainable national development as a process of improving the range of opportunities that will enable human societies and communities to achieve their aspirations and full potentials over a sustained period of time while maintaining the resilience of economic, social and environmental systems. This presupposes that the fulfillment of hopes of present generations through human activities without compromising the aspirations of future generations.

Age (2005), identified some objectives which sustainable national development is expected to realize as increasing per capital income and employment, promoting human welfare and wellbeing satisfying basic needs and protecting the environment. Considering the uncertainty that surrounds the welfare and wellbeing, and the future generations, achieving equity between and the future in participating

on a broad basis in decision making for development of the present is important.

Primary Education and Sustainable National Development

Primary education plays a crucial role towards the attainment of sustainable national development in different ways. These include:

1. Fostering Human Capital. Primary education lays the foundation for knowledge acquisition and skill development, which are essential for individual and national growth. It equips children with basic literacy and numeracy skills, which are crucial for subsequent educational attainment and employability. In other words, Primary education helps in building human capital by equipping individuals with basic literacy, numeracy, and critical thinking skills. This enables individuals to participate in the labour market, which in turn contributes to economic growth and development. As noted by UNESCO (2014), investment in primary education generates significant returns in productivity and earning potential, which contributes to national economic development.

2. Promoting Equality. Access to quality primary education can reduce inequalities in society. Education empowers marginalized groups, including girls and rural populations, thereby promoting gender equality and social inclusion. According to the United Nations Development Programme (UNDP, 2016), equitable access to education is linked to sustained economic growth and improved social outcomes. Education can break the cycle of poverty, enabling disadvantaged individuals to improve their socio-economic status.

3. Enhancing Social Cohesion. Primary education cultivates a sense of community and social responsibility. It promotes values such as tolerance, respect, and cooperation among students from diverse backgrounds, which is vital for social cohesion. The World Bank (2018) emphasizes that education fosters social stability and peace, reducing conflict and promoting nation-building.

4. Supporting Environmental Sustainability. Education at the primary level can instill a sense of environmental stewardship in children. By integrating environmental education into the

curriculum, schools can raise awareness about sustainability and the importance of conserving natural resources. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2017), education plays a key role in promoting sustainable lifestyles, which is crucial for addressing global environmental challenges.

5. Contributing to Health and Well-being. Primary education is linked to improved health outcomes. Educated individuals tend to have better health knowledge, leading to healthier lifestyles and reduced healthcare costs. The World Health Organization (WHO, 2015) states that education, particularly for women, leads to better health and nutrition practices, thereby contributing to overall national development.

Primary education is therefore a fundamental building block for sustainable national development for its ability to provide individuals with necessary skills and knowledge to contribute to economic growth, social well-being, and environmental sustainability.

Financing Primary Education in Nigeria

According to Global Partnership for Education (2021), primary education is supposed to be funded through a combination of government funding, private sector contributions, and international aid. Buttressing this assertion, the organization expressed that the government, as the primary provider of education in most countries, is expected to allocate a significant portion of its budget towards funding primary education. This funding covers expenses such as teacher salaries, school infrastructure development, educational materials, and training programmes.

UNESCO (2021) viewed that in addition to government funding, the private sector, including businesses, non-profit organizations, and individuals, can also contribute to funding primary education through donations, partnerships with schools, and funding specific projects or programs. International organizations and donor agencies may provide financial support to primary education in developing countries through grants, loans, and technical assistance. Thus, primary education funding should be a shared responsibility among various stakeholders, with the goal of ensuring equitable access to quality education for all children.

In considering the sources of financing education in Nigeria, Ajeyalemi (2009) said that, sourcing finance for education can be derived from money paid by parents and government, loans, gifts and grants. Agreeing with this argument, UNESCO (2013) remarked that in developed countries, education is entirely financed by taxation, but in developing countries other sources could be explored. Therefore, educational expenditure as an aspect of educational finance deals with how the amount allocated to education is spent (Wales, 2015). This may be used not only as an instrument for analyzing financial aspects of education, but also as a parameter for projecting the trends of the development of the educational system (Wales, 2015).

Supporting this point, the Central Bank of Nigeria (CBN, 2012) reported that expenditure on education in Nigeria is through budgetary allocations. The sad story about founding primary education in Nigeria however is that no budgetary allocations are exclusively made running the schools. They are left at the mercy of local government administrator.

Challenges Facing Primary Education and it's Funding in Nigeria

Primary education and its funding in Nigeria face several significant challenges, including inadequate government allocation, corruption, and socio-economic factors. These include:

1. Inadequate Government Allocation. Nigeria allocates a disproportionately low percentage of its national budget to education. As of 2021, it was approximately 6-7%, which falls below the recommended 15% by the African Union (Mansaray, 2015).

2. Corruption and Mismanagement. Financial mismanagement and corruption at various levels of government hinder the effective allocation and use of funds. Reports have shown that a significant portion of educational budgets is misappropriated (OECD, 2019).

3. Socio-Economic Barriers. Many families can't afford the costs associated with primary education, including uniforms, books, and transportation. This is exacerbated in rural areas where poverty rates are higher (UNICEF, 2020).

4. Infrastructural Deficiencies. Most primary schools lack basic facilities like classrooms, toilets, and teaching materials. The dilapidated infrastructure reduces the quality of education and discourages enrollment (World Bank, 2021).

5. Teacher Shortages and Training. There is a shortage of qualified teachers in Nigeria. Many teachers lack proper training, impacting the quality of education delivered (Education Commission, 2021).

Conclusion

The paper established that primary education plays a crucial role towards the attainment of sustainable national development in different ways as it promotes human capital development, social equality, social cohesion, health well-being and environmental Sustainability. These necessitate the need to fully finance the primary education sector in the country. However, some challenges stand to affect this funding process which include inadequate government allocation to education, corruption and mismanagement, socio-economic factors, infrastructural deficiencies, as well as teacher shortages and training. The paper posits that these challenges would continue to deter the actualization of the desired development until they are fully overcome. Based on this, the following recommendations are highlighted as the way forward.

The Way Forward

In order to get rid of the identified challenges for achieving the sustainable national development, the following recommendations are sacrosanct for consideration:

1. There is need to increase Budget Allocation. The Nigerian government should commit to increasing budgetary allocations for education to at least meet or exceed the 15% target set by the African Union or reach to the 26% recommendation of the UNESCO.

2. There is need to combat corruption by strengthening governance frameworks and accountability mechanisms in the education sector so as to help ensure that funds are well-managed.

3. There is need for community involvement. Engaging local communities in school management can enhance accountability and encourage parents to support educational initiatives.

4. There is need for enhancing public-private partnerships. The government can leverage private sector resources through partnerships to improve funding and infrastructure development.

5. There is need to address the infrastructural needs. This is by prioritizing the rebuilding and maintenance of school infrastructure so as to create an environment conducive for learning.

6. There is need to improve teacher training and retention. This could be by investing in teacher training programmes and creating incentives for teachers to work in rural areas can help improve education quality.

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Strategies for Improving Teaching and Learning of Computer Science in Selected Senior Secondary Schools in Sokoto State

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Abstract

The study investigated strategies for improving teaching and learning of computer science in some selected senior secondary schools in Sokoto State. Descriptive survey research design type was used. A total of thirty (30) Senior Secondary Schools were randomly sampled. Principals, Vice Principals and all the Computer Science teachers were selected and a total of 120 respondents were employed to form the sample size. The Instrument with reliability index of 0.84 was adapted. Data were analyzed using mean and standard Deviation and null hypotheses was tested using ANOVA at 0.05 level of significance. It was revealed that there significant in the mean rating of respondents on the strategies for improving availability and quality of instructional facilities required for effective teaching and learning of computer science in the state. Part of the recommends stated that school authority (Education Secretaries and principals) should ensure that computer science teachers are sponsored on retraining programmes at least twice a year through workshop, seminars and conferences to enable them learn the modern technological skills in their chosen field of endeavor.

Keywords: Strategies, Teaching, Learning, computer science, secondary school

Introduction

Computer science education was first introduced into the Nigeria educational system (6-3-3-4) in 1982 then as computer science as a result of the newly National Policy on Educational that came into being after the National Curriculum Conference of September, 1969, Ojo (2008). I n attempt to realize the objectives of setting up introductory technology, there must be adequate teaching of the subject on the part of the teacher as well as adequate learning on the part of the students (Magaji, 2006). Computer science is now regarded as one of the prevocational subjects, and according to Obanya (2007), it is a school subject providing students with a process of orientation in production and consumption through experiences in planning, testing, servicing and evaluating types of consumer and industrial

goods. Ogbazi (1989) reported that the Federal Government felt that the 6 – 5– 3 system was not meeting the needs of the society hence the introduction of the 6 – 3 – 3 – 4 system. According to him, the Federal Government renamed the subject   computer science and proposed the 6 – 3 – 3 – 4 system of education, all this is done in an attempt to ensure that the societal needs were met. According to World Bank in Etim (2006), secondary education is now being recognized as the corner stone of the education system in the 21th century. It therefore, means that quality secondary education is indispensable in creating a bright future for individuals and nations alike. The learner is therefore, seen as the central figure of curriculum implementation process.

This study therefore seeks to investigate possible strategies that could be adopted for improving the teaching and learning of computer science which will foster the realization of the national goals and objectives.

Adeyegbe (2012) noted that computer science was structured to assist learners to develop interest in computer. The aim therefore as outlined in the National Curriculum for secondary school was that at the end of secondary schools, computer appreciation would have been attained and solid foundation laid for students' entrance into a vocation of their choice. Olaniyan and Ojo (2008) stated that a nation that does not take the development of computer science seriously will find her nation being relegated to the back bench in the committee of nations, even if such a nation has all the resources in the world, she would still be poor socially, economically and politically.

Lack of functional education however leads to unemployment which by extension leads to underdevelopment in any nation saddled with this problem. Investigation shows that schools in Sokoto State have inadequate Computer laboratories, computers and other teaching and learning equipment's needed for computer science studies. These equipments are not only insufficient but those available have not been totally benefit. The use of computer in teaching is a relevant and functional way of providing education to learners in order to assist them developing the required capacity for the world to work (Kosoko-Oyedeko & Tella, 2010). The National Policy on Education was well structured and the contents well defined but implementation calls for question (Ajala, 2002).

Without proper improvement on the problems comforting computer science teaching in senior secondary schools in Sokoto State, students

upon graduation, are bound to be completely obsolete and unmarketable in our contemporary society where knowledge of computer has become a prerequisite for employment, interview and in some cases for promotion. There is no doubt that much studies on computer science education in Nigerian secondary schools exist, it appears however, that such studies did not focus attention on the situation of computer science education in Sokoto state.

Several efforts have been made to evaluate the implementation of science and technology education programmes in Nigerian schools. Eguabor, (2000) points to the fact that students find aspects of the concepts and principle outlines of science and technology curricula difficult to understand despite teachers' efforts to explain and illustrate in such units. The causes of these difficulties arise from a number of factors such as poor teaching and the abstract nature of the concepts. Zahra (2013) noted that ICT has taken a prominent collaborative position as a tool for various creativities in education. It is equally serving as a catalyst in modifying teaching and learning activities to the advantage of both teachers and learners in the learning environment. Awotunde (2004) further point out that, the syllabi of science and technology are defective since they place little or no emphasis on traditional technologies of the student's environment. The efforts to transform the Nigerian society technologically according to him must be based partly on the acquisition of skills and knowledge in the traditional technologies at the secondary school level. Andrews (2017) observed that, the science and technology curricula was overloaded with contents which had a little relevance to the societal needs. As a result of this, many students left the Junior Secondary School without having the capability to join vocations, talk less to being scientifically literate enough to take rational decisions in adulthood.

Research Questions

1. What are the strategies for improving the funding for effective teaching and learning of computer science in senior secondary in sokoto

2. what are the strategies for improving the availability and supply of instructional facilities required for effective teaching and learning of computer science

3. To what extend are strategies for improving the methodologies required for teaching computer science improve.

Hypotheses

H$_{01}$: There is no significant difference in the mean responses of Principal, Vice Principal and Teachers on the strategies for improving the availability and quality of instructional facilities required for the teaching and learning of Computer science in senior secondary schools in Sokoto State.

H$_{02}$: There is no significant difference in the mean responses of Principals, Vice Principals and teachers on the strategies for improving teaching methodologies required for the teaching and learning of Compute science in senior secondary schools in Sokoto State.

Methodology

This study adopted a descriptive survey research design with a questionnaire as the major instrument of data collection. A qualitative survey research design according to Osuala (2001) centers on individuals and their opinion, belief, motivation and behavior. Descriptive survey research design type was used. Three objectives and research questions were formulated to guide the study. A total of thirty (30) Senior Secondary Schools were randomly sampled. Principals, Vice Principals and all the Computer Science teachers were selected and a total of 120 respondents were employed to form the sample size. Data were analyzed using mean and standard Deviation while null hypotheses were tested at 0.05 level of significance. The questionnaire items were sub-divided into four sections 'A', 'B', and C', . While 'A' comprised of 5 items designed to find out strategies for improving adequate funding for effective teaching and learning of computer science in senior secondary schools in Sokoto. Section 'B' comprised of 5 items designed to determine strategies for improving instructional facilities required for effective teaching and learning of computer science in senior secondary schools. Section 'D' comprised of 5 items designed to assess strategy for improving methodology required for teaching computer science in some senior secondary schools in Sokoto State. It has fifteen items which were graded on four point of: Strongly Agree (SA)-4 Agree (A)-3 Disagree (D)-2 Strongly Disagree (SD) The instrument used was adapted from (Ogbazi, 1989) with a reliability, co-efficient of 0.84.

Results

Table1: Strategies for improving funding for effective teaching and learning of computer science

S/N	ITEM STATEMENTS	N	X	Std. D	Decision
1	Fund allocated to senior secondary schools offering Computer Science should be increase	120	3.77	.547	Agreed
2	Donating computers to senior secondary schools should be Involving PTA	120	3.45	.646	Agreed
3	Cash/ICT equipents received from ICT competition or debate should be invested for improving effective teaching Computer Science	120	3.21	.620	Agreed
4	Community should Involving in donating computers to senior secondary schools offering Computer Science	120	3.14	.863	Agreed
5	Apply charges on all students when collecting their certificates	120	2.70	1.06	Agreed

Table 1 revealed that the mean responses of the respondents to 5 items to be greater than the cut-off point of 2.60. This shows that majority of respondents used for the study agreed with the items as the strategies for improving the funding for effective teaching and learning of computer Science in Senior Secondary Schools.

Table 2: Strategies for improving the availability and supply of instructional facilities required for teaching and learning of computer science

S/N	ITEM STATEMENTS	N	X	Std. D	Decision
6	Government should provide training for computer science teachers in order to conversant with the basic computer skills required for effective teaching and learning.	120	3.68	.568	Agreed
7	Standard computer library should be provided by donor agencies or PTA for day to day us be teachers and students of computer science.	120	3.45	.532	Agreed
8	Government should provide training for Teachers on basic different instructional methods, using computer and ICT facilities.	120	3.38	.735	Agreed
9	Government should liaise with private organizations or NGOs modern Computer E-Library with adequate Computers/ ICT facilities for the effective teaching.	120	3.26	.824	Agreed
10	Adequate qualified computer teachers should be employed.	120	3. 21	.963	Agreed

The data presented in Table 2 revealed that, items 6, 7, 8, 9, and 10, has the cut-off point of 2.60. This shows that majority of respondents used for the study agreed with the items as the strategies for improving availability and supply of instructional facilities required the effective teaching and learning of computer Science in Senior Secondary Schools.

Table 3: Strategies for improving the methodologies required for teaching and learning of computer science

S/N	ITEM STATEMENTS	N	X	Std. D	Decision
11	Computer science students Participation should be encouraged among student in project work.	120	3.65	.568	Agreed
12	Discussion, Demonstration and practicum method should be used.	120	3.44	.532	Agreed
13	More time should be allocated to practical approach	120	3.25	.735	Agreed
14	Teaching and learning materials such as				

	computer printers. scanner etc. may be used in teaching computer to help achieved desire learning objective	120	3.26	.824	Agreed
15	More computer studies should be introduced to secondary schools in other to increase number of computer teachers	120	3. 14	.963	Agreed

Table 3 indicated that all 5 suggested strategies (items, 11, 12, 13, 14 and 15) had their mean ratings above the cut-off point of 2.60. This indicated that majority of respondents used for this study agreed with these items as strategies for improving the methodologies required for Teaching and Learning of Computer Science in Senior Secondary Schools in Sokoto State.

Table 4: Strategies for improving the availability and supply of instructional facilities required for teaching and learning of computer science

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	146.413	2	73.207	.436	.210
Within Groups	820.712	117	7.015		
Total	967.125	119			

Table 4 Revealed the result of F-ratio not to be significant at 0.05 level of significant: F (2,279) = .436; p>0.05. The F-ration of 436 with a p-value as .210 calculated at 0.05 level of significance and at 117 degree of freedom to be greater than 0.05. The null hypothesis was therefore accepted as postulated not to have any significant difference in the mean ratings among respondents on the strategies for improving the availability and quality of instructional facilities.

Table 5: strategies for improving the methodologies required for Teaching and Learning of Computer Science in Senior Secondary Schools in Sokoto State.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	247.879	2	123.939	6.156	.003
Within Groups	2355.713	117	20.134		
Total	2603.592	119			

Table 5 it revealed the result of F-ratio not to be significant at 0.05 level of significant. F (2,279) = 6.150; P> 0.05. The F-ratio of with a p-value as .003 calculated at 0.05 level of significance and at 117 degree of freedom to be less than 0.05. The null hypothesis was therefore rejected because we have statistically significant on the strategies for improving the methodologies required for Teaching and Learning of Computer Science in Senior Secondary Schools in Sokoto State.

Discussion

The study in table 1 reveal that, through funding, physical facilities such as computers and other ICT resources and infrastructure

required for teaching and learning are procured, maintained, and man-power employed. Without adequate funding of any project no matter how laudable it maybe, it becomes extremely difficult to actualize the objectives of such as program. Teaching and learning of computer science at the secondary school level required adequate funding by the government and other stake holders of our education system.

The data presented in Table 2, provided answers to research question The findings revealed that the availability and supply of instructional facilities such as computers, internet modern software, printers, generators, scanners joy stick, Laptops, server systems etc will help to improve the understanding of students in learning of computer science. The use of computers for instruction can be classified into computer assisted instruction and computer managed instruction which helps to improve the design and delivering of individualized instruction required to take care of individual differences in the teaching and learning process.

The result in the research question, which was analysed and presented in table 3 indicated that the teaching and learning of computer science can be improved by improving the teaching methodology adopted by computer science teachers. This findings in line with Etuk (2007) who remarked that teachers need to be properly educated to be morally responsible enough to ensure that ICT is not adopted in the classroom as surrogate teaching but as a means to enhance innovations in teaching and learning, creativity, building confidence and sense of self-reliance in both the teachers and the students. The findings further revealed that computer science teachers and other subject teachers in general should be retrained to become computer literate since a good number were not exposed to computer and its skills during their years of straining (Etuk, 2007).

The results in the null hypothesis 1, analysed and presented in table 4, show accepted as postulated not to have any significant difference in the mean ratings among respondents on the strategies for improving the availability and quality of instructional facilities.

The results in the null hypothesis 2, analysed and presented in table 5, show rejected because we have statistically significant on the strategies for improving the methodologies required for Teaching and Learning of Computer Science in Senior Secondary Schools in Sokoto State.

Conclusion

The study concludes that there are some basic strategies that could be adopted in order to improve the Teaching and Learning of Computer science in Senior Secondary Schools in Sokoto State. Computer science should provide sound basis for further training in computer science at the post- primary education thus should be relied upon to enable students acquired basic and knowledge needed to either secure a job and earn a living or to pursue further studies in the area of computer science. Evidence from the study also revealed that funding strategies for computer studies could be used to improve the Teaching and Learning of Computer science in Senior Secondary Schools in Sokoto State offering computer studies. It is also found that strategies for improving the availability and supply of instructional facilities as well as teaching methodologies strategies could be used to enhance the teaching of computer studies in secondary schools. It is evident in the study that students are adequately trained under an improved learning environment where instructional facilities are provided and qualified teachers engage for the services of teaching and learning applying by proper teaching techniques there is no doubt that the performance of students in computer science studies will improve considerably and as such they are bound to develop a remarkable interest in computer studies and develop the necessary skill required to secure and succeed in the workplace.

Recommendations

1. School administrators (Education Secretaries and Principals) should ensure that computer science teachers are sponsored on retraining programmes through workshops, seminars and conferences to enable them learn the modern computer science skills for effective and efficient teaching.

2. Government and private organizations should liaise and provide adequate computers, modern E-library and other instructional materials needed for effective and efficient teaching of computer science.

3. Parent Teacher Association and other major stakeholders can assist secondary schools by donating instructional facilities like leptons, desktop computers, internet facilities to enable students acquire modern skills of computer science in our senior secondary schools

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Evaluating the Effectiveness of Mobile Technologies on the Teaching and Learning Process in Usmanu Danfodiyo University, Sokoto

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Abstract

Using information technologies for improving the teaching and learning process is becoming popular, thanks to its countless benefits such as assessing learning content anytime and anywhere, adjusting the content to students' needs and timely feedback. The purpose of this pilot study is to Evaluating the Effectiveness of Mobile Technologies on the Teaching and Learning Process in Usmanu Danfodiyo University, Sokoto. The methodology is a descriptive survey research in nature which assesses whether both the lecturers and students are technologically and psychologically ready for the use of mobile technologies in education. The population of the study consist of 50 lecturers and 150 students were selected through simple random sampling technique. The instrument for this study was constructed by the researcher and validated by two experts from Usmanu Danfodiyo University, Sokoto. The questionnaire is known as Mobile Technologies Improvement Needs (MTIN). The questionnaire was developed to collect the data from lecturers and students. The questionnaire items were sub-divided into three sections 'A', 'B', and C', then each section comprised of 15 items which were graded on five point of: Strongly Agree (SA)-5 Agree (A)-4 (UNC)-3 Disagree (D)-2 Strongly Disagree (SD)1. Data were analyzed using mean score for calculated overall level of agreement / disagreement for each statement. For mean score norm was 3.00. However, level of agreement was different for each statement. The data was also analyzed percentage with the help of Statistical Package for Social Science (SPSS 22.0 version). A narrative approach and quantitative tools such as frequency tables and percentages were used to arrange and present the result. The findings of the study revealed that majority of lecturers and students used mobile phone technologies to support their teaching and learning. From the data analysis some of the challenges students faced when using mobile phones to support their learning are cost of the phone, battery life and network. In conclusion, lecturer and students will no longer need to be limited to the ability to tech and to learn at a particular place and time in the future. Finally, the researcher recommends some points from the conclusion that a well-resourced mobile learning facility Centre needs to be established within the higher institutions where lecturers and students who lack experience with using mobile technologies will be trained.

Keywords: Mobile Technologies, Process, Teaching and Learning, University

Introduction

Education is necessary for everyone. Education is very important, without education no can lead a good life. Teaching and learning are the important element in education. The teacher uses different methods and material to teach their students and their effective learning. With the passage of time, different methods and techniques are entered in the field of education and teacher use different kind of aids to make effective teaching. The mobile learning (m-learning has become an increasingly attractive solution for schools and universities that utilize new technologies in their teaching and learning setting. This study emergence and advancements of Information and Communication Technologies (ICTs) have change the way teaching and learning processes are being conducted. ICTs facilitate immediate access to information resources needed for teaching and learning.

The need for mobile learning in our society is uncountable. Its impact will continue to improve the standards of the citizen of our countries. The ability to use m-learning effectively has become an essential part of education. Despite the roles mobile learning can play in educations, higher institutions in Nigeria are yet to extensively adopt them fully for teaching and learning. In recent years, the rapid development in wireless and communication technologies and market forces have made mobile devices widespread and relatively cheap, with fast and easy internet access, mobility, and more convenience, including with regard to e-services such as e-commerce and educational applications such as mobile learning (m-learning) (Almaiah et al., 2016). According to Friend (2011), ICTs have capabilities of improving information accessibility facilitating communication via electronic facilities; enhancing synchronous learning and increasing cooperation and collaboration.

Technologies support learning and teaching are attracting many educators in different educational fields to provide more efficient learning and teaching methods (Virtanen et al., 2018). Mobile Technology has been simply defined as learning that takes place with the help of mobile devices Quinn (2003). Mobile technology can be defined as using mobile technologies for educational purposes. Similarly, (Traxler 2005) commented that mobile learning can be defined as educational provision where the sole or dominant technologies are handheld or palmtop devices. Technology is rapidly growing in all aspects of modern societies, and education is no exception. In line with this trend, information and communication

technology is increasingly utilized as a teaching and learning tool in educational activities (Matimbwa et al 2016). Academic institutions, like a learning organization, also pay considerable attention to the use of advanced technologies to facilitate their progress, especially in the areas of teaching and learning (Grabe, 2008) Mobile technologies is just as important as oral and written communication in the work environment.

Technology continues to play a vital role in transforming the work and business environment. Abdullah M. et al, (2021) Teachers are using technologies to facilitate learners by using modern teaching tools and resources. According to Abdullah (2023), online learning depends on availability of internet, suitable infrastructure, learning management systems (LMSs) and the effective educational policies. With the use of mobile technologies, the potential for effective teaching and learning is growing (Sanga 2016)

Literature review

Many researchers investigated the benefits of mobile learning for teaching and learning within schools and universities environments. Mobile technology has been utilized as a tool to support students learning basic programming concepts (Giannakoulas & Xinogalos, 2018), to improve students learning ability to discover new knowledge in learning natural science (Hung et al., 2014), learning resources in museums (wang et al., 2016), and learning contents and location information using active learning support system (Hsu et al., 2016). In addition, m-learning is an eminently suitable technology for application in conventional higher education course teaching. It supports collaborative learning, which is particularly useful in language learning as well as its general facilitation of ubiquitous learning services (Alnabhan et al., 2018).

Mobile learning (m-learning) currently is a well-established methodology. It has been in use for almost 20 years and its use offers an anytime and anywhere method of learning. Nearly all university students in developed countries possess some kind of mobile device and 50% of them possess more than one (Rezaei, 2018). The most used mobile devices among young people appear to be smartphones. The largest group as far as the use and ownership is concerned is young adults between 18 years and 29 years. Research on the use of mobile phones and mobile applications (apps) used in English language teaching indicates that the implementation of mobile apps contributes to the development of all four language skills (reading,

listening, speaking, and writing).) There is no doubt that the booming of smart phones currently gives numerous opportunities for students to utilize mobile application in supporting learning activities (Wendeson et al, 2010).

The smart phones play a very important role in education, in that it offered a major chance in enhancing access to learning resources. This enables many institutions, especially in higher education, to develop learner support as well as learning opportunities in ways which would build on current methods. In a research, Shuler (2009) points out that smart phones offer students opportunities to gather, access, and process information outside the classroom as well as support learning in a real-world context. He continues to point out further that smart phones promote collaboration, communication (as these are considered vital for 21st century academic success) and can also help encourage instruction that is adaptable to individual and diverse learners.

In Nigeria, mobile learning has been experimented by tutors and experts through partnerships between the University of Ibadan and Educational Advancement Centre to guarantee outstanding results in the Join Admission and Matriculation Board (JAMB UTME) available for secondary school students (SS1, SS2, SS3 and retake students). The positive impact of using mobile technology stated by Peachey (2010) especially for blended learning, social learning, student-centred learning, and project based learning, all of which are supported in mobile learning implementation.

Mobile technology systems providing great service quality and stakeholder satisfaction is considered the main factor for a successful m-learning process in higher education environments (Sarrab et al., 2016). UNESCO in 2012 launched four pilot projects to explore how mobile technologies can be used to support and develop teachers in Mexico, Pakistan, Nigeria and Senegal. Bere and Rambe (2019) also examined in their study pre-service teachers' preparedness for mobile learning in teacher training colleges. The results showed that future teachers' preparedness did not vary by gender, and that they used mobile technologies mostly for communication, studying, access to information and making plans. Brown (2018), in his dissertation, addressed higher education teachers' perceptions of mobile learning, and the results showed that mobile learning techniques and tools were useful in teaching and learning approaches, effective in formulating classroom instruction strategies, useful for professional

learning, influential over time constraints when acquiring knowledge at any time and place, and facilitating teacher-student communication. To inform these; in their deliberations UNESCO (2011) believed that ICT can contribute to achieving universal education worldwide, through the delivery of education and training of teachers, improved professional skills, better conditions for lifelong learning, and the potential to reach people outside the formal education process. Alfarani (2015) argued that the number of students who uses mobile devices as educational resources will continue to rise sharply. According to Kukulska and Hulme (2014), emerging technologies pose many practical and ethical challenges to educators. Recent research reports that, some educators see mobile technologies as disruptive tools that are not useful and increase distraction from learning (UNESCO, 2012). It is worth to mention that a lot of studies in m-learning field concentrate on m-learning acceptance using Technology acceptance model (TAM) (Clark 2007).

The education and training provided to the students through mobile technology systems in university level today are far inadequate for graduate. So many formulated objective of Nigeria Technical colleges curriculum are yet being achieved (Giannakoulas & Xinogalos, 2018). This is due to the lack of analysis and presentation of clear picture of some factors and situation before designing the curriculum. Considering the numerous recent and future area mobile technologies and its effects on economic growth and technological development the trend in most development countries is that high priority is usually placed on technologies at the level of education (Sarrab et al., 2016). However, there is shortage of researches that considering the effectiveness use of mobile technologies in teaching and learning at university level Therefore, the author of this study attempts to analysis the effectiveness use of mobile technologies in teaching and learning at university level purposefully designed and tailored-made.

Objective of the Study

1. Evaluate students academically satisfied with the use of mobile phone in learning at university level?

2. Determine of lecturers competent in the utilization of mobile technologies in teaching and learning process at university level?

3. Find out the challenges influencing mobile learning usage by students and lecturers at university level?

Research Questions

1. What extent are students academically satisfied with the use of mobile phone in learning at university level?

2. What is the extent of lecturer's competent in the utilization of mobile technologies in teaching and learning process at university level?

3. What challenges influencing mobile learning usage by students and lecturers at university level?

Methodology

This study adopted a descriptive survey research design. A survey research design according to Osuala (2001) centers on individuals and their opinion, belief, motivation and behavior. The study was conducted in Sokoto State, Nigeria. Sokoto is a major city located in the extreme northwest of Nigeria, near the confluence of the Sokoto River and the Rima River. Sokoto is the modern-day capital of Sokoto State and was previously the capital of the north-western states. It is one of the country's 36 states, and the state has an area of 25,973 km2 and a population of around 3,702,676 people as at 2006 population census. Sokoto has two distinct climates, the dry season (November-May) and the rainy season (June-October) with an average rainfall of 629mm.

The population of the study consist of 50 lecturers and 150 students from department of Curriculum study and computer Science were selected through simple random sampling technique. Gay and colleagues (2009) points out that for a descriptive study; between 10% - 30% of the available population was sufficient enough to be used as a sample. Hence, this sample was considered representative to characterize the target population. This sampling technique focused on participants that were capable of providing rich and significant information that suited the purpose of the study (Dean, 2010). This approach was also used because only students who had the mobile phone and were using them for learning purposes were considered.

The instrument for this study was constructed by the researcher and validated by two experts from Usmanu Danfodiyo University, Sokoto. The questionnaire is known as Mobile Technologies Improvement Needs (MTIN). The questionnaire contained items sub-divided into three sections 'A', 'B', and C',.

Section 'A', In order to determine the empirical reaction of the students on each item, the mean score on all (15) fifteen items was calculated in table no 1.

Section 'B', In order to determine the factual reaction of the students on each item that most of the lecturers agreed that students academically satisfied with the use of mobile phone technology in teaching and learning, the mean score on the (15) fifteen items was calculated in table no 2.

Section '' C' in order to find out the pragmatic response of the lectures on each item, the mean score on all (15) fifteen items was calculated in table no 3.

The total of forty-five (45) items which were graded on five point of: Strongly Agree (SA)-5 Agree (A)-4 (UNC)-3 Disagree (D)-2 Strongly Disagree (SD)1.

Data were analyzed using mean score for calculated overall level of agreement / disagreement for each statement. For mean score norm was 3.00. However, level of agreement was different for each statement. The data was also analysed percentage with the help of Statistical Package for Social Science (SPSS 22 version).

To calculate the mean score, following formula was used.

Mean Score= (FSAx5+FAx4+FUNCx3+FDAx2+FSDAx1)

N

Where

FSA= Frequency of strongly agreed

FA= Frequency of agreed

FUNC= Frequency of uncertain

FDA= Frequency of disagreed

FSDA= Frequency of strongly disagreed

Results

Table 1: Item wise analysis of lecturers

S/N Score	Statements	Means
1	Students understand more effectively with the use of mobile learning.	4.47
2	Students take interest when teacher use mobile technologies	4.30
3	mobile technologies play important role in teaching process	3.87
4	mobile phones increases access to current and important information	4.00
5	Special training for using mobile technologies is necessary	3.41
6	I'm satisfied with how mobile T are being used for students' group disc. & pres.	3.63
7	Use of mobile technologies help a teacher during teaching process	3.80
8	Use of mobile phone technology provide easy way to teach a difficult concept	3.41
9	mobile technologies save time lecturer time	3.40
10	mobile technologies make teaching process more meaningful	3.80
11	mobile technologies share lecturer s' burden.	2.90
12	mobile technologies easily available in classroom	2.63
13	mobile technologies provide first-hand knowledge to students	2.64
14	Extra and detail study for exams effect on students' performance	3.80
15	Students participate actively as compare to simple teaching	3.34

Table 2: Item wise analysis of students

S/N Score	Statements	Means
1	Lecturer use mobile technologies related to topic	3.34
2	I strength of wireless am satisfied with networks.	3.73
3	Students feel difficulty to understand with mobile technologies	2.87
4	mobile technologies make learning effective	3.24
5	Lecturer are expert to use mobile phone technologies	3.72
6	mobile technologies save students' time	3.53
7	mobile technologies provide difficult things in simple way to std.	3.76
8	Lecturer clear the concepts of student by using mobile phone technology	3.88
9	Lecturer guide their students to use properly mobile learning	3.21
10	Lecturer use mobile technologies according to his needs	3.37
11	mobile technologies motivate the students towards learning	3.32
12	Lecturer use unnecessarily mobile technologies in classroom	2.31
13	mobile learning motivates the students towards learning	3.64
14	mobile technologies play important role in students' learning	3.45
15	mobile technologies provide help to students in different assignment	4.21

Table 3: Item wise analysis of lecturer and students

S/N Score	Statements	Means
1	The keypad is too small making it hard to type.	3.97
2	There is potential increase in plagiarism (cut-copy-paste)	3.34
3	Students will be more distractible in classroom	3.57
4	There is potential cheating on homework and exams	3.73
5	Students feel difficulty to understand with mobile learning	2.87
6	Social Media may distract students from their Academic work	3.24
7	Increase of poor reading and writing skills amongst students.	3.72
8	There are frequent network problems with service providers	3.53
9	The cost of recharge cards/airtime is too high.	3.76
10	Sometimes, there is limited area of network	3.82
11	The screen is relatively small making it difficult to see some information	3.21
12	mobile phone technology provides internet bandwidth	3.37
13	lecturer use unnecessarily mobile technologies in classroom	2.31
14	mobile learning plays important role in students' learning	3.45
15	Use of mobile learning bring negative change in classroom environment	2.27

Discussion

Firstly, the study's findings indicate that the majority of students utilize mobile phone technologies to support their learning, which is consistent with previous research (e.g., [1], [2]). These technologies were employed for various purposes, including text messaging, research, emails, social networking, and accessing scientific dictionaries or calculators. Students used these technologies frequently. Most students appreciated that mobile phones have a great potential for educational purposes. However, the study's results contradict the findings of [3], who argued that mobile phones are primarily used for social purposes rather than educational ones. In contrast, this study demonstrates that students appreciate the potential of mobile phones for educational purposes, which is in line with the findings of [4].

Secondly, majority of students were satisfied with the way mobile phone technologies were being used for teaching by their lecturers in classroom most of the students agreed that lecturers are competent in the utilization of mobile technologies in teaching and learning process at university level. Another finding is that many lecturers use mobile phone technologies to support teaching. A follow up question was able to reveal that majority of lecturers were accessing up-to-date information and reading materials online through their mobile phones. This follow-up seemed useful and made them aware of the instructional possibilities of the mobile phone technology. This finding

supports the results of [5], who found that lecturers' competence in using mobile technologies positively impacts students' academic performance. The realization that this technology was being utilized in teaching by lecturers is important in this process.

Thirdly, regarding the challenges encountered when using mobile phones in supporting teaching and learning, the study's findings are consistent with those of [6], who identified cost, battery life, and network failure as significant obstacles. Adomi [7] also reported that network failure is a major challenge faced by students when using their mobile phones in Nigeria.

Conclusion

The study found that, In the future lecturer and students will no longer need to be limited to the ability to tech and to learn at a particular place and time. Mobile devices and wireless technologies will become an everyday part of learning both inside and outside of the classroom. All teaching staff and students mentioned to use text messages, calls, social media, you tube and mobile phone applications. Income hindered some from accessing useful m-learning applications as they were sold. Moreover, this study's findings highlight the importance of mobile phone technologies in supporting teaching and learning at the university level. While the results contradict some previous findings, they are largely consistent with the existing literature on the topic.

Recommendations

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

1. A well-resourced mobile learning facility Centre needs to be established within the higher institutions, where staff and students who lack experience with using mobile phone technology will be trained and have the opportunity to use these technologies to support educational experiences. This could be a project in public higher institutions, which allow lecturers and students to appreciate smartphones. A follow-up with some training on the appropriate use of mobile phones in teaching and learning can be important. The use of these mobile phone technologies will also increase the satisfaction of students.

2. Students should take a more active role in the learning process and take an interest in using mobile phone technologies to improve educational experiences. Students should be encouraged by their lecturers to make more use of chat rooms, such as zoom, Microsoft team, telegram and WhatsApp for group discussions, share images for explaining scientific concepts and processes, use videoconferencing for face-to-face group discussions, read eBooks and download scientific materials from the internet.

3. Lecturers should encourage students in the use of mobile phone technologies in their learning. These technologies can provoke the interest of the students and make subjects learning more interactive. As a result, lecturers should explore different ways in which mobile technologies can be used in teaching and learning. For example, mobile phone learning through tutoring, games, quizzes, podcasts (audio/video) and e-books. This will make students more aware of the possibilities of these technologies and therefore will try to exploit their full potential. To engage students effectively and meaningfully, lecturers should provide course content and other learning materials online, so that students will get the opportunity to download this information onto their phones in order to access it at any time or anyplace instantaneously. This will allow students to be fully prepared before lectures as well as supplementing and reinforcing information that have already been taught in class. Lecturers can also formulate automatic alerts to their students on important information, such as quiz dates, additional required readings as well as links to helpful websites. These mobile phone technologies will go a long way in supporting student's learning, therefore increasing their academic performance.

4. Curriculum planners and policy makers should consider student's learning styles in the use of mobile technologies in subjects learning. Instruction should be designed in such a way so as to connect with multiple learning styles that are appropriate through mobile phones. Lecturers have a role in identifying their student's learning styles hence should encourage matching mobile phone technologies and resources to these styles. This includes integrating sound, visuals, music and games into the learning environment. Content developers and programmers should come together to design and develop

educational mobile phone applications that can be used in learning various topics in Biological science in order to provide tools for authoring, manipulation and communication. These applications should be simple for easy navigation for both students and lecturers. A rubric for selecting applications should be developed and distributed to lecturers so as to provide specific criteria for effective learning. An online database should be established to provide relevant educational applications for lecturers and students.

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Teacher Resource Planning and Selection as Corelates of Teacher Effectiveness in Public Secondary Schools in Sokoto State

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Abstract

The study examined the impact of human resource planning and selection on teacher effectiveness in Public Senior Secondary Schools in Sokoto State. The study was guided by two objectives, research questions and hypotheses. The study adopted the descriptive survey design. The population was 3,905 involving 2,831 teachers and 264 Principals. The sample size was 340 principals and teachers. The study employed a self-developed questionnaires as the instruments for data collection. Both the validity and reliability indices of the instruments were established at 0.8, 0.8 and 0.7, 0.9 respectively. The data gathered were analysed using mean and standard deviation for answering the research questions while the null hypotheses were tested using t-test statistics at 0.05 level of significance. Based on the analyses, the findings of the study revealed that teacher human resource planning and selection are essential factors that contribute to teacher effectiveness in schools. It is thus concluded that any school that needs to improve the effectiveness of its teachers must strive towards planning and selecting the kind of teachers to be engaged or employed for the teaching services. The study recommends that government at all level should positively intensify effort in making effective teacher human resource planning and selection for schools in order to improve the extent of their effectiveness so as to meet up with current managerial challenges of public secondary schools.

Keywords: Human-Resource, planning, selection, teacher, effectiveness

Introduction

The success of any school depends on the availability and efficient management of both human and material resources. That is why Carnevale and Hatak, (2020) argued that with the rapid development in the educational sector and the projected increase in sizes and demand for education, there is need to effectively channel principals' attention towards the function and usefulness of human resources in a given school, otherwise, the goal of the school which is aimed at instituting teaching and learning will be jeopardized. Thus, within the school context, teachers' effectiveness is very necessary in determining the extent to which learners learn and it is their duty to ensure they raise good students in character.

Teacher effectiveness, therefore, refers to the statutory curricula function that is performed by the teachers to enable learners to achieve the set educational goals in the schools (Chancellor *et al.*, 2018). According to them, this ultimately depends on the commitment of the principals and teachers to make judicious and adequate use of both human and materials resources, to harness them together and bring job effectiveness in conformity with the standards expected, and thus, teacher effectiveness is crucial. An effective teacher does not create an image of the students but aids the students in developing their own image by comprehending their issues, making any subject engaging, managing the class, and treating them fairly (Habib, 2017). He further stressed that successful teachers' activities in the classroom, are crucial to students' successful and efficient learning. Therefore, enhancing teacher effectiveness is essential for raising students' accomplishment and learning. This calls for their proper planning and selection in schools.

Human resource planning is the most important function that must be carried out in an organization to ensure the availability of the right workforce for the right roles, tasks and jobs at the right time, all for those goals and objectives that have been set (Carnevale & Hatak, 2020). Human resource planning therefore, involves a set of activities that anticipate and respond to future job and environmental requirements of the organization (Sing *et al.,* 2020). Human resources planning is the process, analysis and identification carried out by the organization regarding the needs for human resources as a result of which the organization can choose the necessary steps to achieve its goals. Apart from that, the crucial thing is to carry out human resource planning is that the organization will have a clear image of the future, and be able to anticipate deficiencies in the quality of work energy that is needed (Chancellor *et al.,* 2018).

Human resource selection on the other hand, is a process of evaluating and interviewing candidates for a particular job and selecting the right person for the right position. Selection is a process of hiring suitable people for job who can successfully perform the job (Prabhu & Abdallah, 2020). When there is vacant position in an organization Human resource Management take a responsibility for finding and selecting the right person for this vacant position. Right man for right job is the main goal of selection (Anwar & Shukur, 2015). Selecting process includes a progression of steps to be taken after for picking the suitable employee for the empty position. This procedure begins after recruitment and partitions the competitors in

two sections the individuals who will be offered work and those won't be. There is a need of all around composed determination process in light of the fact that at exactly that point right kind of applicant can be chosen and unsatisfactory candidates are rejected (Sultan *et al.,* 2020). The selection process changes from association to association and even from department to another department inside of the same association. Like in a few associations therapeutic examination is done after definite choice while in other it might be done before conclusive choice (Abdullah & Othman, 2015).

Teacher resource planning plays an important role in human resource management because it translates the objectives of the school into a number of workers needed by determining the human resource required by the school to achieve its strategic goals (Samwel, 2018). Activities can be controlled, organized and managed through teacher resource planning. Teacher Resource Planning (TRP) is the process of anticipating or projecting the present and future teacher needs of a school to ensure that the right personnel are in the right place at the right time. Ashish (2017) perceived teacher resource planning as the act of designing job, assessing the demand and supply structure, finding the gap through either internal or external recruitment, such that the desired teachers can be clustered to satisfy the objectives of the school. Similarly, Anyadike (2013) expressed that teacher resource planning is a school management activity that involves a careful analysis of existing teachers, job requirements and developing teachers who will run the structures of the school now and in the future in order to ensure the achievement of objectives.

It is therefore, one of the responsibilities of the principals to evaluate and plan for present and future manpower requirements of their schools to estimate the demand for staff and source of supply to satisfy the demand. The sources of supply could be through request from Government or Parent- Teacher Association (Habib, 2017). It is essential to conduct teacher resource planning since hiring the wrong teachers or failure to anticipate fluctuations in hiring needs could be costly in the long run (Maina & Kwasira, 2015). Aslam *et al.* (2013), noted that the main purpose of teacher resource planning is to make ensure that a school have the right number of teachers as required i.e., there is neither a surplus of teachers nor a shortage and also make sure that the personnel have best level of interaction with their jobs.

Teacher selection deals with the process of evaluating and interviewing candidates for a particular job of teaching and selecting the right ones for the right positions (Abdullah & AbdulRahman, 2015). Once schools have decided on the appropriate means through which they will recruit potential teachers for the job, their next task is to identify the most appropriate and effective method to use in order to select the right persons when there is vacant position in the schools (Anwar & Abdullah, 2021). Human resource Management unit of the school should take a responsibility for finding and selecting the right teachers for the vacant positions (Anwar & Shukur, 2015).

Teacher selection processes are most reflected in the classroom through student outcomes. How students perform determines whether a hire has been successful. A poor selection can deprive students from receiving an adequate education. When undertaking the process, most administrators make screening and selection decisions based on resume applications, letters of recommendation, credentials, and interviews (Engel & Finch, 2015). Screening involves eliminating applicants who do not meet the requirements set by the employer and compiling a list of applicants who will be interviewed (Cranston, 2017). Mason and Schroeder (2016) lamented that some school principals lack a value system based on specific criteria to screen potential hires. Selection process consists of applicants submitting their résumés online or presenting to recruiters at job fairs (Jacobson, 2014).

It seemed that there are research inadequacies in the area of examining the corelation between teacher resource planning, selection and teacher effectiveness in senior public secondary schools in Sokoto State Nigeria as all other studies reviewed were out of the context and the extent of that relationship has not been empirically examined. This necessitated the need for this research so as to fill both research and literature gaps.

Statement of the problem

It is a well-known fact that all schools depend on a skilled and qualified teaching workforce to achieve educational outcomes, and that their success depends on their capacity to recruit and keep qualified teachers. More specifically, the majority of teachers decide to enter the profession because they think that teaching is a worthwhile profession that can make a significant contribution to society. Despite these factors, it is still true that a sizable portion of newly hired teachers quit their jobs, typically within the first five years. Additionally, while the benefits of having great teachers are obvious, it

is less clear what draws and maintains highly effective instructors in the classroom as well as what makes them leave education and their career.

Making teachers effective, however, is still a difficult task. Numerous difficulties have plagued the secondary school education system in Sokoto state. The difficulties include inadequate money, inadequate infrastructure, political affiliation in selecting, orientation, promotion, teacher development, teacher compensation, and a shortage of instructors, particularly in the state's rural areas. One of the most difficult issues facing the education system in Sokoto State has been recognized as the teacher shortage, which is mostly attributed to poor rates of teacher training and low levels of welfares, recruitment, promotions, and political affiliation in hiring of teachers. The stakeholders have recently expressed serious concerns about teacher effectiveness. When compared to their counterparts in other professions, teachers don't seem to be as trained or driven. Many people are working because of unemployment or admissions issues, and as a result, they have non-chalet attitudes towards the teaching and learning processes. Additionally, the teaching profession has become a dumping ground for graduates from all disciplines due to the high graduation rate from our higher educational institutions despite the limited career options. Many teachers in the foundational primary and secondary schools lack the most basic teaching credentials. Poor motivation and training led to the quick. In light of these, the study examined the relationship between human resources management and teacher effectiveness in Sokoto State, Nigeria, looking at factors like human resource planning, recruitment, selection,

Research Objectives

This research seeks to find out the relationship between:

1. Teacher resource planning and teacher effectiveness in public senior secondary schools in Sokoto state.

2. Teacher selection and teacher effectiveness in public senior secondary schools in Sokoto state.

Research Questions

The study seeks to answer the following research questions.

1. To what extent does teacher resource planning correlate with teacher effectiveness in public senior secondary schools in Sokoto state?

2. To what extent does teacher selection correlate with teacher effectiveness in public senior secondary schools in Sokoto state?

Research Hypotheses

Based on research questions and objectives, the study formulated the following null hypotheses that will be tested at 0.05 level of significance.

H_{o1}: There is no significant relationship between teacher resource planning and teacher effectiveness in public senior secondary schools in Sokoto state.

H_{o2}: There is no significant relationship between teacher selection and teacher effectiveness in public senior secondary schools in Sokoto state.

Methodology

The study adopted a descriptive survey research design of correlational type. The population of the study was 3,905 consisting of 264 principals and 2831 teachers in all the public senior secondary schools in Sokoto State. The sample size of the study was 340 respondents consisting of 29 principals and 311 Teachers. The researcher employed stratified random sampling techniques. Two researcher-designed questionnaires titled 'Teacher Resource Planning and Selection Questionnaire' (TRPSQ) and 'Teacher Effectiveness Questionnaire' (TEQ) were used to collect data for the study. Content and face validity of the instruments were carried out and with the use of Cronbach's Alpha, their reliability coefficients of 0.83 and 0.79 were respectively established. Mean and Standard Deviation were used to answer the research questions while Pearson Product-Moment Correlation Statistics was used to test the formulated hypotheses at 0.05 level of significance.

Results

Research Questions One: To what extent does teacher human resource planning correlate with teacher's effectiveness in public senior secondary schools in Sokoto state?

This research question is answered by the data presented in table 1 thus:

Table 1: Extent of correlation between Teachers Human Resource Planning and their Effectiveness

S/n	Variables	Freq.	Rate	χ	SD	Extent
1	Teachers Resource Planning	285	83.88%	3.3559	.35340	VHE
2	Teachers Effectiveness	271	79.85%	3.1940	.23834	HE

Source- Field Survey (2024)

The presented data in table 1. shows the extent of relationship between teachers' human resource planning and their effectiveness. The result revealed that teacher resource planning was rated 83.88% with frequency of 285, mean scored of 3.3559 and Standard Deviation of .35340, indicating that there was a very high extent of teachers' human resource planning in public secondary schools in Sokoto state, Nigeria. Teachers Effectiveness was rated 79.85% with frequency of 271, mean scored of 3.1940 and Standard Deviation of .23834, indicating high extent of teachers' effectiveness in secondary schools in Sokoto state, Nigeria. Thus, the extent of teacher resource planning was rated higher than their effectiveness in secondary schools in Sokoto state, Nigeria [Teacher resource planning mean scored (3.3559) > teachers effectiveness mean scored (3.1940)]. Therefore, Teacher resource planning correlates high with their effectiveness in public secondary schools in Sokoto state, Nigeria.

Research Questions Two: To what extent does teacher selection correlate with teacher's effectiveness in public senior secondary schools in Sokoto state?

This research question is answered by the data presented in table 4.3 thus:

Table 2: Extent of correlation between Teacher selection and teacher Effectiveness

s/n	Variables	Freq.	Rate	χ	SD	Extent
1	Teachers' selection	278	81.98%	3.2794	.45795	VHE
2	Teachers Effectiveness	271	79.85%	3.1940	.23834	HE

Source- Field Survey (2024)

The presented data in table 2 shows the extent of teachers' selection and their effectiveness. The result revealed that teachers' selection was rated 81.98% with frequency of 278, mean scored of 3.2794 and Standard Deviation of .45795, indicating that there was a very high

extent of teachers' selection in public secondary schools in Sokoto state, Nigeria.   Teachers Effectiveness was rated 79.85% with frequency of 271, mean scored of 3.1940 and Standard Deviation of .23834, indicating high extent of teachers' effectiveness in secondary schools in Sokoto state, Nigeria. Thus, the extent of teachers' selection was rated higher than their effectiveness in secondary schools in Sokoto state, Nigeria [teachers' selection mean scored (3.2794) > teachers effectiveness mean scored (3.1940)]. Therefore, teachers' selection correlates high with their effectiveness in public secondary schools in Sokoto state, Nigeria.

Null Hypothesis One: There is no significant relationship between teacher human resource planning and teacher effectiveness in public senior secondary schools in Sokoto state.

Table 3: Relationship between teacher human resource planning and teacher effectiveness

s/n Variables	N	X	SD	DF	Crit.-r value	P- value	Decision
1 Teacher resource planning	340	3.3559	.35340				
2	340	3.1940	.23834	12	.678	.000	Ho1 Rejected
Teacher effectiveness							

Alpha level = 0.05

Table 3 reveals the number of participants (n) = 340, and a Crit.-r value =   .678 and P-value of .000. Testing the hypothesis at alpha level = 0.05. The P-value is greater than alpha value, .000 < 0.05. Hence the null hypothesis which states that there is no significant relationship between teacher resource planning and teacher effectiveness in public senior secondary schools in Sokoto state is rejected. Therefore, there is significant relationship between teacher resource planning and teacher effectiveness in Sokoto state. This means that the teacher human resource planning is cordially related to their effectiveness in public senior secondary schools in Sokoto state. By implication, it means that teacher resource planning leads to their effectiveness in public senior secondary schools in Sokoto state, Nigeria.

Null Hypothesis Two: There is no significant relationship between teacher selection and teacher effectiveness in public senior secondary schools in Sokoto state.

Table 4: Relationship between teacher selection and teacher effectiveness

S/n	Variables	N	X	SD	DF	Crit.-r value	P-value	Decision
1	teacher selection	340	3.2794	.45795	12	.397	.000	Ho1 Rejected
2	teacher effectiveness	340	3.1940	.23834				

Alpha level = 0.05

Table 4 reveals the number of participants (n) = 340, and a Crit.-r value = .397 and P-value of .000. Testing the hypothesis at alpha level = 0.05. The P-value is greater than alpha value, .000 < 0.05. Hence the null hypothesis which states that there is no significant relationship between teacher selection and teacher effectiveness in public senior secondary schools in Sokoto state is rejected. Therefore, there is significant relationship between teacher selection and teacher effectiveness in public senior secondary schools in Sokoto state. This means that the teacher selection is cordially related to their effectiveness in public senior secondary schools in Sokoto state. By implication, it means that teacher selection leads to their effectiveness in public senior secondary schools in Sokoto state, Nigeria.

Discussion

The study aimed to determine the relationship among teacher resource planning and selection in Secondary Schools in Sokoto State, Nigeria. The findings of the both the research question and hypothesis indicates that there is significant relationship between teacher resource planning and teacher effectiveness in public senior secondary schools in Sokoto state, Nigeria. This finding is similar to the study of Sampson, Alfred and Konnie (2019) who investigated the welfare management practices that affect teachers' job performance evidence from Ghana. The result of the analysis indicated that effective working condition such as flexible working hours, safety environment, proper ventilation, proper lighting and availability of natural light, manageable class size, support from head teacher, and availability of teaching learning environment led to improve teacher performance. Also, the findings were supported by Samwel,2018). Ashish (2017) Anyadike (2013) Mbiu and Nzulwa (2018) Ekwoaba and ldeh (2015) and it was not in line with the study by Aslam, Aslam, Ali, Habib &Jabeen (2013), noted that the main purpose of human resource planning is to make ensure that organization have right number of workforces as required i.e., there is neither a surplus of manpower nor a shortage and also make sure that personnel have best level of interaction with their jobs.

The second research question and hypothesis showed that there is significant relationship between teacher selection and teacher effectiveness and thus, teacher selection leads to the effectiveness of teachers in public senior secondary schools in Sokoto state, Nigeria. This finding is in line with the study conducted by Chukwu and Ezepue (2018) who investigated the impact of promotion as a personnel policy implementation for teacher retention and efficiency among secondary school teachers in South-Eastern Nigeria. Their study revealed that, personnel policy implementation of selection and promotion enhanced teacher performance on the Job and has positive impact on teacher retention among secondary merit and due process in the promotion of teachers. Abdullah and Abdul Rahman, (2015) as well as Anwar and Abdullah, (2021) agreed that teacher's effectiveness must take a responsibility for finding and selecting the right person for this vacant position. The finding was opined by Mason and Schroeder (2016) who explained that principals' selection of teachers in public schools does not promote teachers' effectiveness.

Conclusion

Based on the findings of the study it was established that there is statistically significant relationship between teacher human resource planning and selection with teachers' effectiveness. It was concluded that teachers' human resource planning, selection are fundamental factors that contribute to teacher effectiveness in Secondary Schools in Sokoto State, Nigeria.

Recommendations

Based on the findings and conclusion of the study it is hereby recommended that:

I. The Sokoto State government should intensify effort in ensuring effective teacher resource planning and selection so as to improve the extent of the effectiveness of the schools to meet up with current realities of life.

II. Professional training and development programmes such as seminars, workshops, and conferences should be regularly organized for teachers by the government, non-governmental organizations and quality assurance departments, so that the performance and effectiveness of teachers could be wholly improved for the benefit of the schools.

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Teachers' Awareness and Perception on Utilization of Artificial Intelligence as a Tools for Teaching and Learning of Chemistry at Secondary Schools in Sokoto State

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Abstract

The integration of Artificial Intelligence (AI) in education, particularly in science subjects like chemistry, has emerged as a transformative force, offering personalized learning, simulations, and real-time feedback. Despite its potential, the adoption of AI tools in secondary schools, especially in Sokoto State, Nigeria, remains limited due to factors such as lack of awareness, inadequate infrastructure, and insufficient teacher training. This study examined secondary school chemistry teachers' awareness and perceptions of AI utilization for teaching and learning chemistry in Sokoto State. A descriptive research design was employed, with a sample of 160 teachers from Sokoto Metropolis. Data were collected using a structured questionnaire and analyzed through descriptive statistics. Findings revealed a low level of teachers' awareness regarding AI tools in chemistry education, with most teachers lacking familiarity with AI applications in their teaching. However, the perception of AI's potential benefits was generally positive, with teachers recognizing the value of AI in enhancing student engagement and offering individualized learning experiences. The study highlights the need for targeted professional development programs to improve teachers' understanding and application of AI in chemistry education. This research contributes to the broader discourse on AI's role in education, particularly in resource-constrained regions like Sokoto State, and provides insights for policy and practice to optimize the use of AI in classrooms.

Keywords: Artificial Intelligence, Awareness, Perception, Chemistry, Teachers

Introduction

In recent years, the global education system has increasingly adopted artificial intelligence (AI) tools to improve the effectiveness of teaching and learning. For example, AIis embedded in curriculum development, adaptive learning platforms and virtual laboratories, providing educators with the opportunity to attract students in a more interactive and immersive way (Kukulska-Hulme, 2020). AI is generally believed that artificial intelligence could revolutionize the way we learn and teach, there are still some lapses in teachers and students showing ineffective and negative attitudes towards the usefulness and application of artificial intelligence to make it more personalized, engaging and efficient (Nedjah, & Johnson, 2019;

Hutchins, 2021; Kautz, Etzioni, & Mooney 2021 Akgun, & Greenhow, 2022). This can be visualized in many academic environments evolving from lack of trust, cost, and unwillingness to use effective technical tools to promote learning and instruction on the teacher as well as the learner side, artificial intelligence has emerged as an element of change in various industries, and the way we teach and learn, and its impact on chemistry as a learning course at secondary and tertiary levels is undeniable (Binns, 2017; Aguolu, 2019; & Flavian & Casalo, 2021). The context of AI in teaching and learning chemistry was based on a theoretical framework is essential for guiding the investigation of teachers' awareness and perception of AI tools in the context of teaching and learning chemistry in Nigerian secondary schools. The theoretical framework provides a foundation for understanding the relationship between teachers' awareness, their perceptions, and the integration of AI in education. The relevant theory is Technology Acceptance Model (TAM) proposed by Davis (1989), is one of the most widely applied models for understanding the factors that influence the adoption and use of technology in educational settings. TAM posits that Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) are key determinants of technology acceptance.

Perceived Usefulness (PU): This refers to the degree to which a teacher believes that using AI tools would enhance the quality of teaching and improve learning outcomes in chemistry. Teachers may perceive AI tools as useful if they assist in better explaining complex chemical concepts, providing interactive simulations, or offering personalized learning experiences for students.

Perceived Ease of Use (PEOU): This refers to how easy teachers believe it is to use AI tools in the classroom. If AI tools are complex, require extensive training, or need high-end infrastructure, teachers may be hesitant to adopt them.

The integration of AI into education most particularly science education is emerging as a transformative platform that improves, teaching and learning in schools. The AI technology has shown significant prospects in various fields science education, referencing to chemistry in this context. Part of these promising prospects include personalized learning, and simulation of complex chemical reactions, real-time assessment and feedback. Olaogun and Oyediran (2023) explored how AI is rapidly transforming various aspects of society, including education. The study involved 74 educators and utilized the

Opinion Scale on Artificial Intelligence in Education to gather valuable insights. The research outcomes reveal a predominantly favourable view of AI in education. The study contributes significantly to the ongoing discourse on the role of AI in education, emphasizing the necessity for a balanced approach that maximizes the benefits of AI while ensuring the protection of the rights and interests of all stakeholders. Furthermore, Sun, Yang and Chen (2021) documented that AI for chemistry education can provide virtualized chemistry laboratories, simulation tools, and artificial intelligence-oriented platforms to help simplify complex concepts of molecular structure, reactions, and chemical equations. However, these benefits are often hampered by gaps in infrastructure and teacher preparation, especially in underdeveloped nation with less infrastructural development in classrooms.

Despite these significance of AI for a more personalized, engaging and efficient, it is revealed that there are still some lapses with regards to the teachers' utilization of artificial intelligence. AI models like Large Language Models, has shown substantial potential in generating educational content. However, this technology's rapid rise has brought forth ethical concerns regarding general and educational use that require careful attention from educators. The UNESCO framework on GenAI in education provides a comprehensive guide to controversies around generative AI and ethical educational considerations, emphasizing human agency, inclusion, equity, and cultural diversity (Blonder & Feldman-Maggor, 2024). This development could be as a result of their level of awareness and readiness toward its full integration (Amoah, Osei, & Kwame, 2020 and Olatunji, Adebayo, & Lawal, 2022). Efforts have constantly been made to incorporate AI into teaching and learning; however, the successful implementation of new instructional technologies is closely related to the attitudes of the teachers who lead the lesson. Teachers' perceptions of AI utilization have only been investigated by only few scholars which indicated an overall lack of experience of teachers regarding how AI can be utilized in the classroom as well as no specific idea of what AI-adopted tools would be like. This is evidenced by Adebayo (2023) that in Nigeria, the government is making efforts to incorporate Information and Communication Technology into education, but the degree of adoption of AI in secondary schools, mainly in Sokoto state, is unknown. The state faces a unique set of challenges, including limited internet connectivity, lack of modern educational facilities, and insufficient professional development opportunities for teachers. These factors

greatly affect the way chemistry teachers access and apply AI tools in the classroom.

In support of the above, a study carried out Kim and Kim (2022) investigated how teachers perceived an AI-enhanced scaffolding system developed to support students' scientific writing for STEM education. Results revealed that most STEM teachers positively experienced AI as a source for superior scaffolding. On the other hand, they also raised the possibility of several issues caused by using AI such as the change in the role played by the teachers in the classroom and the transparency of the decisions made by the AI system. These results can be used as a foundation for which to create guidelines for the future integration of AI with STEM education in schools, since it reports teachers' experiences utilizing the system and various considerations regarding its implementation. Furthermore, Güneyli, Burgul, Dericioğlu, Cenkova, Becan, Şimşek, and Güneralp (2024) investigated the level of awareness among teachers regarding the use of AI in education, focusing on whether this awareness varies according to socio-demographic characteristics, access to technology, and specific knowledge and beliefs about AI. Conducted in Northern Cyprus during the 2023–2024 academic year, this study employed a survey model with purposive and snowball sampling methods, involving 164 teachers. Teachers at different levels, namely, primary school, secondary school, high school, and university, were included in this study. This study explored the distribution of AI use across different school types and educational levels and assessed the impact of sub-dimensions of AI awareness on its application in teaching. Findings revealed low level AI awareness among teacher most particularly at primary and secondary levels of education. However, usage patterns indicated that university lecturers were more likely to incorporate AI in their teaching, followed by primary and high school teachers, with secondary school teachers using it the least. These results highlight the importance of practical knowledge for fostering AI integration in educational practices, underscoring significant implications for teacher training and professional development programs.

Statement of the Problem

Regardless of the utmost utilization of AI in enhancing the delivery of chemistry concepts which has undeniably captivate several individuals' attention and generate various opinions on AI vary because some teachers are not fully aware of how and where this tool

could be accessed and even be applied to guide their classroom instructions. In Sokoto State, the research is not clear about teachers' beliefs on whether AI can assist them in overcoming several challenges and expedite processes of teaching and learning of chemistry concepts. Hence, this study examined teachers' awareness and perception on utilization of artificial intelligence as a tools for teaching and learning of chemistry at secondary schools.

Objectives of the Study

This study examined teachers' awareness and perception on utilization of artificial intelligence as a tool for teaching and learning of chemistry at secondary schools in Sokoto state. More specifically, the study examined the level of:

1. teachers' awareness on utilization of artificial intelligence as a tool for teaching and learning of chemistry at secondary schools in Sokoto State
2. teachers' perception on utilization of artificial intelligence as a tool for teaching and learning of chemistry at secondary schools in Sokoto State.

Research Questions

The following research question were responded to by the research:

1. What is the level teachers' awareness on utilization of artificial intelligence as a tool for teaching and learning of chemistry at secondary schools in Sokoto State?
2. What is the level teachers' perception on utilization of artificial intelligence as a tool for teaching and learning of chemistry at secondary schools in Sokoto State?

Methodology

This study examined the level of teachers' awareness and perception on the utilization of artificial intelligence as a tools for teaching and learning of chemistry at secondary schools in Sokoto state. It aimed to describe teachers' awareness and perceptions on utilization of AI as a tool for teaching and learning of chemistry at secondary schools. Hence, it employed descriptive research design. A sample of 165 was randomly selected from the population of 288 teachers in the Sokoto Metropolis. The instrument for data collection was Teachers' Awareness and Perception Questionnaire (TAPQ) structured in the form of four point likert scale designed by the researcher, validated by

two experts in the field of Chemistry Education. After a pilot testing, a reliability coefficient of 0.68 was obtained. During data collection, 165 questionnaires were distributed but 160 were retrieved properly filled by the respondents. The data collected were analyzed using descriptive statistical analysis of simple percentage of frequency and average mean. A benchmark mean point of 2.50 was regarded as acceptable level of agreement. Therefore a mean score of less than 2.50 indicated that the respondents disagrees with the statement and a mean score of 2.50 and above shows that the respondents agrees with the statement.

Table 1: Teachers' Awareness on Utilization of Artificial Intelligence

S/N	Items	SA (%)	A (%)	D (%)	SD (%)	Mean	Decision
1	The concept of Artificial Intelligence is well familiar to me	20(12.5.2)	32(20)	45(28.1)	63(39.4)	2.05	Disagree
2	I understand how Artificial Intelligence is utilized in the teaching and learning of chemistry	19(11.8)	30(18.8)	37(23.1)	74(46.3)	1.96	Disagree
3	I am acquainted with how Artificial Intelligence is utilized in teaching and learning of chemistry	23(14.4)	36.(22.5)	31(19.4)	70(43.8)	2.08	Disagree
4	I am familiar of the potential benefits chemistry teachers would gained when they used artificial intelligence	11(6.9)	38(23.8)	37(23.1)	74(46.3)	1.91	Disagree
5	I'm conversant with the simulation in Artificial Intelligence as a tool used for teaching and learning chemistry	10(6.3)	9(5.6)	67(41.9)	74(46.3)	1.72	Disagree
6	I came across how Artificial Intelligence can aid in chemistry problem solving	31(19.4)	70(43.8)	23(14.4)	36.(22.5)	2.60	Agree
7	I attended relevant trainings on how to integrate Artificial Intelligence in the teaching and learning of in chemistry	10(6.3)	9(5.6)	67(41.9)	74(46.3)	1.72	Disagree

Table 1 indicated that the respondents disagrees with all the items except item 5 that "I'm conversant with the simulation in Artificial Intelligence as a tool used for teaching and learning chemistry". The result shows a mean score that is less than the benchmark mean point of 2.50 that was regarded as acceptable level with the exception of item5 that a mean score of 2.60 which is greater than 2.50. This revealed that the level of teachers' awareness on utilization of AI as a tools for teaching and learning of chemistry at secondary schools in

Sokoto State is low, indicating that most of the teachers are not fully aware on how utilize AI as a tools for teaching and learning of chemistry at secondary schools.

Table 2: Teachers' Perception on Utilization of Artificial Intelligence

S/N	Items	SA (%)	A (%)	D (%)	SD (%)	Mean	Decision
1	Learning chemistry can be made more engaging for students by Artificial Intelligence	33(28.1)	63(39.4)	28(12.5.2)	32(20)	2.56	Agree
2	Virtual labs and simulations are examples of AI tools that can aid students in comprehending difficult chemistry concepts	34(21.3)	58(36.3)	23(14.4)	45(28.2)	2.51	Agree
3	Artificial intelligence (AI) can help students in chemistry to have a more individualized learning experience	33(20.6)	60(37.5)	23(14.4)	44(27.5)	2.51	Agree
4	Artificial intelligence (AI) can assist chemistry learners have a more individualized and personalized learning experience	31(19.4)	70(43.8)	23(14.4)	36.(22.5)	2.60	Agree
5	Chemistry teachers need a lot of help to use AI tools because they are too complex	36(22.5)	70(43.8)	23(14.4)	31.(19.4)	2.70	Agree
6	Artificial Intelligence based chemistry tools are difficult to be used in chemistry instruction	83(51.9)	52(32.5)	19(11.8)	6(3.8)	3.33	Agree
7	Artificial Intelligence sometimes provide inaccurate or irrelevant recommendation which make it not easy for chemistry teachers to take decision	20(12.5.2)	32(20)	45(28.1)	63(39.4)	2.05	Disagree

Table 2 indicated that the respondents agrees with all the items exception of item 7 that "Artificial Intelligence sometimes provide inaccurate or irrelevant recommendation which make it not easy for chemistry teachers to take decision". It shows a mean score that is greater than the benchmark mean point of 2.50 that was regarded as acceptable level with the exception of item 7 that a mean score of 2.05 which is less than 2.50. This revealed that the level of teachers' perception on utilization of AI as a tools for teaching and learning of chemistry at secondary schools in Sokoto State is positive, indicating that most of the teachers positively perceived the usefulness and ease

of use of AI as a tools for teaching and learning of chemistry at secondary school.

Discussion

The discussions of the findings were done based on the objectives of the study. The first finding indicated that there is low level of teachers' awareness on utilization of AI as a tools for teaching and learning of chemistry at secondary schools in Sokoto state. This finding is in line with that of Güneyli, Burgul, Dericioğlu, Cenkova, Becan, Şimşek, and Güneralp (2024) who investigated the level of awareness among teachers regarding the use of AI in education in Northern Cyprus, focusing on whether this awareness varies according to socio-demographic characteristics, access to technology, and specific knowledge and beliefs about AI. Their Findings revealed low level AI awareness among teacher most particularly at primary and secondary levels of education. However, usage patterns indicated that university lecturers were more likely to incorporate AI in their teaching, followed by primary and high school teachers, with secondary school teachers using it the least. These results highlight the importance of practical knowledge for fostering AI integration in educational practices, underscoring significant implications for teacher training and professional development programs.

Secondly, the findings revealed positive perception among teachers on the utilization of artificial intelligence as a tools for teaching and learning of chemistry at secondary schools in Sokoto State is positive. This finding coincides with the finding of a study carried out by Kim and Kim (2022) investigated how teachers perceived an AI-enhanced scaffolding system developed to support students' scientific writing for STEM education. Results revealed that most STEM teachers positively experienced AI as a source for superior scaffolding. On the other hand, they also raised the possibility of several issues caused by using AI such as the change in the role played by the teachers in the classroom and the transparency of the decisions made by the AI system.

Conclusion

In conclusion, the integration of AI into secondary school chemistry education in Sokoto State has shown promising potential but also significant challenges. The findings indicate that there is a low level of teachers' awareness regarding AI as a tool for teaching and learning, despite its potential to enhance student engagement, provide

personalized learning experiences, and improve the understanding of complex chemistry concepts. This aligns with studies in other regions where AI awareness and usage are similarly limited, especially in resource-constrained environments. However, teachers' perceptions of AI were largely positive, highlighting the potential of AI to make chemistry education more engaging and individualized. This suggests that while teachers may be open to AI, they face barriers in accessing adequate training, resources, and infrastructure.

The study underscores the need for targeted professional development programs that enhance teachers' awareness and skills in utilizing AI effectively. Additionally, overcoming challenges such as inadequate infrastructure, lack of technological support, and insufficient teacher training are crucial for the successful integration of AI in chemistry education. To fully realize the benefits of AI in education, stakeholders must focus on developing comprehensive strategies that not only increase awareness but also provide the necessary tools and support for teachers, ultimately improving the quality of education in Sokoto State and beyond. By addressing these issues, AI can be harnessed as a transformative tool in the teaching and learning of chemistry, enhancing both educational outcomes and teacher effectiveness.

Recommendations

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

1. provide awareness campaigns and workshops to familiarize teachers with the concepts, benefits, and practical applications of AI in the classroom. Such programs should focus on demonstrating how AI can enhance chemistry teaching, such as through simulations, virtual labs, and personalized learning tools.
2. schools in Sokoto state should invest in the necessary technological infrastructure, such as reliable internet access, AI-enabled platforms, and computer labs, to support the effective use of AI tools. This will enable teachers and students to take full advantage of AI technologies for teaching and learning.
3. AI tools should be adapted to the local educational context, addressing the specific needs and challenges of Sokoto State's secondary schools. This includes developing AI resources that can work effectively in low-resource settings and aligning AI-based educational tools with the local chemistry curriculum.

4. stakeholders should focus on addressing ethical issues and ensuring that privacy concerns are properly managed. Clear guidelines on the ethical use of AI in schools should be developed and communicated to teachers, students, and parents.

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Bibliometric Analysis of Postgraduate Dissertations and Theses Research Output of the Departments of Library and Information Sciences 2007-2022 in the Universities in North-West, Nigeria

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Abstract

The present study bibliometric analysis of postgraduate dissertations and theses research output of the Departments of Library and Information Sciences 2007-2022 in the universities of North-west Nigeria. The investigators attempted to reveal the distribution of Postgraduate Dissertations and Theses research output, examine the differences between the Masters and PhD research output and the year-wise distribution between dissertations and theses of the Departments understudy. Using a descriptive survey approach, the study sampled 651 from the three universities that offered postgraduate degrees in library and information science through a census method. The study employed self-designed content analysis checklists with descriptive statistics and frequency-based data presentation in tables. The Results showed that, the greatest percentage of dissertations and theses submitted between 2007 and 2022, 354 (54.37%) were from Ahmadu Bello University (ABU) in Zaria. Bayero University (BUK) Kano came second with 290 (44.55%) and Umaru Musa Yar'adua University (UMYU) emanated the least with 7 (1.08%) submission. The differences between the number of dissertations and theses, ABU has the highest number of MLS dissertations 299 (45.92), while UMYU has the least numbers 7 (1.07). Meanwhile, ABU has also the highest number of PhD theses 55 (8.44%). The findings also reveal that the highest 67 (10.29%) submissions of the dissertations and theses were produced in 2022 while the least 10 (1.53%) were produced in 2008. The study recommended among other things that there should be more documentation librarians attached to these university libraries whose duty should be tracking down research reports.

Keywords: Bibliometric, Dissertations, Theses, Postgraduate, Library

Introduction

Allan Pritchard coined the phrase "bibliometric analysis" in 1969 replaced the term "Statistical Bibliography." The term 'bibliometrics' comes from the Latin word 'biblion' and the Greek word 'metrics.' the word "Biblion," which means "Books" while the word "Metrics" is derived from the Latin word "Metricus," which means "Measurement." Etymologically, it means the application of mathematics to the study of bibliography. Bibliometrics measures advancement of science by analyzing the number of scientists produced using statistical methods by determining the various documents that scientists use to conduct

studies on how much information is consumed. Bibliographic references of publications from a specified time period that are found in the lists and information sources that are used to carry out these studies. These bibliographic tools support the application of quantitative approaches to assess the production processes and offer sufficient information about the main document to enable effective bibliometric research. Numerous sources, including bibliographies, bibliographic databases, and citations, are used to generate bibliometric data. Any sufficiently substantial publication list that has been assembled and released, citations from particular journals, and citation indexes can all be used as the basis for bibliometric analysis. These bibliometric methods describe publication patterns within a field or body of literature by using quantitative analysis and statistics. According to Hertzel (2003), bibliometrics is the study of books and other communication media via the use of statistical and mathematical techniques. In its most basic form, bibliometrics refers to the use of mathematics to the study of bibliography. Makama, (2016) defined the term bibliometrics as the study and quantification of the publication patterns of all written forms of communication and their authors. In scientific terms, it is the analysis of recorded communication. Bibliometric analysis, according to Sengupta (2012) as cited in Kannan and Thanuskodi, (2019), is the process of organizing, classifying, and quantifying the publications pattern of micro and macro publications through mathematical and statistical computations. It is a set of methods to quantitatively analyze scientific and technological literature (Bellis 2009). Based on the aforementioned definitions of the term, it is inferred that bibliometrics study the patterns of authorship, publication, and literature used by applying various statistical analyses. Bellis Further described bibliometrics as the study of publications and communication patterns in the distribution of information by using mathematical and statistical techniques, from counting to calculus. Bibliometrics therefore serve as the application of quantitative techniques in order to evaluate the processes of production, communication, and use of scientific information. It is also perceived by Hawkins (2001) as the application and quantitative analysis in the bibliographical references of the body of literature, with the aim of contributing to the analysis and evaluation of science and research.

Dissertations and Theses demonstrate both an original contribution to knowledge and significant subject expertise in a discipline, as well as significant scholarly achievement (Kushkowski et al. 2003). For these reasons, studies on doctoral and masters dissertations in various

disciplines have garnered a lot of interest. Research reports are not simply partial fulfillment for degree awards, but rather a purposeful response to questions posed by society; they have much to give to its progress. Research reports are reflections of researchers' areas of interest in a field of study. Theses and Dissertations are not just a measure of research output, but also of the generation of qualified workforce, which is critical in today's knowledge society (Andersen and Hammarfelt 2011). Academic staff members who are knowledgeable with the research process and the area chosen by the students for research supervise and guide the researchers. The report also highlights the intellectual foundation and the breadth of research coverage of course content in the topic. It is also used to assess National research performance in an International perspective, as well as to characterize the evolution of a scientific area.

Nkiru (2010) conducted a study on "Bibliometric Analysis of Postgraduate Research Reports in Library and Information Science in Nigerian Universities from 1993-2006" discovered that the distribution of research in Library and Information Science in Nigeria from 1993 to 2006 by productivity of the research output in the field of library and information science in Nigeria, broken down by university and ranked from most to least in number of reports. 358 research reports, or (47.9%) of the total production of 747 research reports throughout the ten Nigerian universities, were produced by the University of Ibadan. The Universities of Nigeria Nsukka (12.3%), Ahmadu Bello University (8.7%), Bayero University Kano (8.6%), Imo State University (7.4%), University of Maiduguri (5.1%), University of Uyo (4.0%), Delta State University (2.3%), Abia State University (2.0%), and University of Calabar (1.7%), were the next in position. In light of the quantity of research output, it can be said that University of Ibadan was the most productive university. The University of Calabar produced the fewest research papers, although it's Department of Library, Archival and Information Studies is Nigeria's most productive academic department in the subject of library and information science. This study is similar to the current research but differs in scope, the study covered the whole country while the current research focuses on a particular region which is North-west.

Study conducted by Adaora (2013) titled "A bibliometric research productivity of librarians published in Library and Information Science Journals available in Academic libraries of Imo State Nigeria 2004-2013" According to analysis, librarians employed by South-East geographical zone tertiary institutions publish more than their

counterparts in other zones. The South-East 582 (38%) response rates it received demonstrate the highest in research productivity. South-West librarians came in second place with 369 (24%), followed by South librarians with 219 (19%). While North-central 203 (13%) came fourth, North-West and foreign librarians came in last with 49 (3%) and 49 (3%) respectively. This could be taken to indicate that, librarians employed by South-East tertiary institutions are more successful in their research endeavors. This analysis is similar with the current study though differs in design and the scope.

Muhammad and Ozioma (2019) study titled "Bibliometric analysis of Nigeria's Library and Information Science literature: A Journal of Applied Information Science and Technology (JAIST)" the results showed that the distribution of authorship in JAIST across the six geographical zones of Nigeria. The South-East, South-West, North-Central and North-West geographic regions are the main hubs for authorship in JAIST, according to the data. 39.8% of the written articles published in JAIST are from the South-East geographical zone, whilst 23.8%, 19.3% and 17.1% come from the South-West, North-Central and North-West geographical zones, respectively. The findings of this study corroborate with Adaora (2013).

Chukwuma (2018) titled "Research output of librarians in the field of library and information science in Nigeria: a bibliometric analysis" As 2018, there were approximately 153 number of universities officially approved by the National Universities Commission (NUC) in Nigeria (NUC, 2018). The findings show the distribution by universities of the 1,106 articles analyzed, 195 (17.6%) are credited to University of Ibadan, followed by University of Nigeria, Nsukka with 113 (10.2%) articles, Delta State University, Abraka with 99 (9.0%) articles, and Federal University of Agriculture, Abeokuta with 73 (6.6%) articles. University of Ilorin 57 (5.2%), Covenant University 56 (5.1%) while University of Lagos 55 (5.0%), Obafemi Awolawo 47 (4.2%) and Bayero University, Kano 32 (2.9%). The remaining universities scoring lower frequencies (34.2%). It is surprising to report that only a few universities, such as University of Ibadan, University of Nigeria, Nsukka; Delta State University, Abraka; Federal University of Agriculture, Abeokuta; and University of Ilorin, are among the top universities in Nigeria in terms of productivity. This analysis is similar with the current one, they differ from methodology, this study used cross-sectional while the current study used census to draw the sample.

Statement of the Problem

Postgraduate dissertations and theses are conducted as a prerequisite for the award of Masters and PhD degrees by universities with a large number of them produced every year particularly from the departments of Library and Information Science. There's still no existing data over how many postgraduate dissertations and theses in Library and Information Science are produced from North-West universities in Nigeria; Bibliometrics analysis is a mathematical and statistical process for determining and identifying the characteristics of documents as well as analyzing the historical growth of a particular topic area: productivity, authorship, publications, and use, among other things. Sengupta as cited in Kannan and Thanuskodi, (2019) defined the term bibliometric as the process of organizing, classifying, and quantifying the publication, pattern of micro and macro publications. Bibliometric analyses have been employed to examine several aspects of the subject literature, including the authors' work as well as the productivity of research output generated in the field. The approaches are the sole way to determine the productivity and utility of a specific resource within a given field.

However, despite the existence of postgraduate degrees offered by the departments of Library and Information Science in the North-west universities it is not known how many dissertations and theses were submitted and yearly distributions, it is not known the differences between the number of dissertations and theses submitted to these universities, it is also not known which university has the highest number of dissertations and theses submitted. The present study investigated the distribution of dissertations and theses output submitted to the Departments of Library and Information Sciences from universities of North-West, Nigeria from 2007-2022.

Objectives

The following are the objectives of the study

I. To find out the Distribution of Dissertations and Theses Research output of the Departments of Library and Information Science in Universities of North-West Nigeria from 2007-2022 by Postgraduate Students

II. To Examine the Differences between the Masters and PhD Research output of the Departments of Library and Information

Science in North-West universities Nigeria from 2007-2022 by Postgraduate Students

III. To Study the Year-wise Distribution of Dissertations and Theses of the Departments of Library and Information Science in North-West universities Nigeria by Postgraduate Students.

Methodology

The survey research method was chosen for the study because it was the most practical and appropriate, especially given the characteristics of the respondents. Survey research does not just seek the present status of population characteristic, but also tries to discover relationship among variables. This study used the content analysis research approach. According to Prasad (2008), content analysis is the scientific study of communication content with the aim of transforming "raw" occurrences into data that can be studied scientifically and used to build up a body of knowledge.

In the North-West Nigeria, there are three (3) universities that offer postgraduate programs in library and information science, those are Ahmadu Bello University (ABU) Zaria, Bayero University Kano (BUK) and Umaru Musa Yar'adua University (UMYU) Katsina, constituted 651 number of dissertations and theses overall in a pilot research that was recently carried out in the institutions using phone calls and in-person visits. However, considering the number of the general population, the researcher considers census population. "If the general population of the study is manageable, the use of the entire population will yield more reliable research result" (Toluhi, 2001).

Results and Discussions

Distribution of Dissertations and Theses Research output of the Departments of Library and Information Science in Universities of North-West Nigeria from 2007-2022 by Postgraduate Students

Table1: Dissertations and Theses output Submitted

S/NO	UNIVERSITY	MLS	PHD	Total	%
1	Ahmadu Bello University (ABU), Zaria	299	55	354	54.37
2	Bayero University (BUK), Kano	270	20	290	44.55
3	Umaru Musa Yar'adua University (UMYU), Katsina	7	0	7	1.08
	Total	576	75	651	100

Table 1 presents the amount of research output produced by postgraduate dissertations and theses from universities in North-West

Nigeria from 2007 to 2022. Out of the 651 total output, dissertations were 576 higher than the theses which accounted for 75. ABU, Zaria produced 354 dissertations and theses accounting for 54.37%. Subsequently, BUK generated 290 dissertations and theses representing 44.55%, of the total. UMYU Katsina came third with total number of 7 masters' dissertation and no single PhD Dissertation from this university, which is because the department is not yet start the PhD program at the point of conducting this study. This finding corroborates with the Nkiru (2010) study in which ABU and BUK were ranked second and third most research productive universities in terms of dissertations and theses output.

Differences between the Masters and PhD Research output of the Departments of Library and Information Science in North-West universities Nigeria from 2007-2022 by Postgraduate Students

Table 2: Differences between the Masters and PhD research output

	ABU ZARIA				BUK KANO				UMYUKATSINA				TOTAL
YEAR	MLS	%	Ph.D	%	MLS	%	Ph.D	%	MLS	%	Ph.D	%	
2007	17	5.68	2	3.63	7	2.49	1	5.0	-	-	-	-	27
2008	-	-	2	3.63	8	2.96	-	-	-	-	-	-	10
2009	40	13.37	2	3.63	10	3.70	1	5.0	-	-	-	-	53
2010	42	14.04	2	3.63	14	5.18	-	-	-	-	-	-	58
2011	30	10.03	6	10.9	15	5.55	2	10.0	-	-	-	-	53
2012	41	13.71	3	5.45	14	5.18	1	5.0	-	-	-	-	59
2013	12	4.01	1	1.81	19	7.03	1	5.0	-	-	-	-	33
2014	18	6.02	4	7.27	17	6.29	1	5.0	-	-	-	-	40
2015	9	3.01	2	3.63	17	6.29	2	10.0	-	-	-	-	30
2016	13	4.34	7	12.72	21	7.77	1	5.0	-	-	-	-	42
2017	8	2.67	8	14.54	18	6.66	2	10.0	-	-	-	-	36
2018	2	0.66	1	1.81	17	6.29	1	5.0	-	-	-	-	21
2019	17	5.68	3	5.45	19	7.03	1	5.0	-	-	-	-	40
2020	21	7.02	6	10.9	21	7.77	1	5.0	-	-	-	-	49
2021	3	1.07	1	1.81	27	10.0	2	10.0	-	-	-	-	33
2022	26	8.69	5	9.19	26	9.81	3	15.0	7	100	-	-	67
Total	**299**	**100**	**55**	**100**	**270**	**100**	**20**	**100**	**7**	**100**	**0**	**0**	**651**
%	45.92		8.44		41.47		3.10		1.07		0		

Table 2 shows the differences of research output between dissertations and theses distributed annually between 2007 and 2022 in the departments of library and information science. Out of 354 research produced by ABU, 299 (45.92%) were postgraduate Masters' dissertations, whereas 55 (8.44%) represent PhD theses. A total of 270 (41.47%) of masters dissertations and 20 (3.10%) PhD theses research was produced by BUK. However, UMYU produced its first doctoral research reports in 2022 and produced 7 (1.07%) masters dissertations.

Year-wise Distribution of Dissertations and Theses of the Departments of Library and Information Science in North-West universities Nigeria by Postgraduate Students.

Table 3: Year-wise Distribution of Dissertations and Theses output

YEAR	ABU		BUK		UMYU		TOTAL	%
	MLS	Ph.D	MLS	Ph.D	MLS	Ph.D		
2007	17	2	7	1	-	-	27	4.14
2008	-	2	8	-	-	-	10	1.53
2009	40	2	10	1	-	-	53	8.14
2010	42	2	14	-	-	-	58	8.90
2011	30	6	15	2	-	-	53	8.14
2012	41	3	14	1	-	-	59	9.06
2013	12	1	19	1	-	-	33	5.07
2014	18	4	17	1	-	-	40	6.14
2015	9	2	17	2	-	-	30	4.60
2016	13	7	21	1	-	-	42	6.45
2017	8	8	18	2	-	-	36	5.52
2018	2	1	17	1	-	-	21	3.22
2019	17	3	19	1	-	-	40	6.14
2020	21	6	21	1	-	-	49	7.59
2021	3	1	27	2	-	-	33	5.07
2022	26	5	26	3	7	-	67	10.29
Total	299	55	270	20	7	0	651	100

An attempt was made to calculate the productivity of research from 2007 to 2022. The number of theses and dissertations produced each year is presented in Table 3. In total, 651 theses and dissertations have been analyzed. Dissertations and theses in the field of research have been produced at a gradually increasing rate. The analysis found that out of 651 dissertations and theses, 67 (10.29%) were published

in 2022 and received the highest ranking. The second most productive year was 2012, with 59 (9.06%) dissertations and theses produced, followed by 58 (8.90%) in 2010. In the same way, 53 (8.14%) were generated in 2009 and 2011, respectively. Furthermore, 49 (7.59%) were produced in 2020. However, 2008 saw the fewest submissions, with 10 (1.53%) theses and dissertations, among other submissions.

Conclusion

Based on the findings of this research, it can be concluded that research reports from PhD theses and master's dissertations in the departments of library and information science of North-West Nigerian universities vary in terms of productivity. According to the study ABU produced the highest amount of postgraduate dissertations and theses research, whereas UMYU produced the fewest. The quantity of research reports generated in the field of library and information science at these North-west universities fluctuated until 2009. After that, the number of research reports produced increased gradually. There were 53 research publications published in 2009, 58 in 2010 and 67 in 2022. However, 67 remained the uppermost figure of dissertations and theses research produced in a year.

Recommendations

The study recommended among other things that:-

I.   There should be more experienced documentation librarians in each university library whose duty should be tracking down research reports, ensuring proper documentations and upward delivery to the university library documentation or postgraduate unit.

II. The number of PhD graduates are very small compared to Masters', therefore there's the need for increase the number of PhD admission so as to compete with other professions.

III. The number of dissertations and theses distributions per year in these universities is too little to celebrate. There's the need to conduct a study to look in to the problem for better improvement.
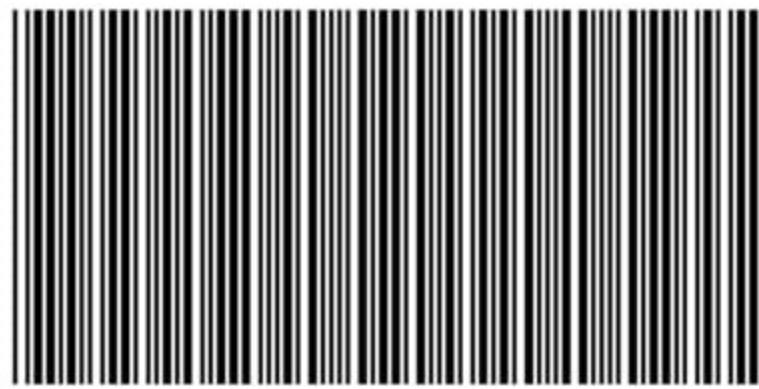
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