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The Role of Artificial Intelligence (AI) in improving Librarian Efficiency in Educational Technology Centers.

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Abstract

This study explored the role of artificial intelligence (AI) in improving librarian efficiency in Educational Technology centres and examined its subsequent influence on students' academic performance. This research analyses the association between the AI-enhanced services and students' academic outcomes. This study employed a mixed-methods approach through a structured questionnaires distributed to librarians working in Centers. The findings suggest that AI integration in library services not only optimizes operational efficiency but also positively influences students' learning experiences and academic achievements. The result of this study revealed that AI has a considerable beneficial influence on librarian productivity in educational technology Centers, notably in automating repetitive work and boosting resource exploration. Based on the study's findings, it was concluded that integrating artificial intelligence (AI) into educational technology centre libraries has the potential to transform student learning and improve educational support services. It was recommended that educational institutions should prioritize investment in robust AI infrastructure tailored towards library services while Library staff, Educators, and Students should be educated about data literacy for interpreting data insights responsibly.

Keywords: *Artificial Intelligence, Educational Technology Centers, Librarian, Efficiency*

Introduction

The use of artificial intelligence (AI) in educational technology centres is a significant development that is changing library services and influencing students' academic achievement. Hence, AI technologies are being used more and more to streamline resource management and user engagement in libraries. This introduction explores the profound implications of AI in enhancing library service efficiency within Educational Technology centres and examines its direct influence on the educational outcomes of students (Liu et al., 2022). Thus, facilitating quicker access to information, personalized learning

experiences, and s t reamlined administrative tasks, AI not only improves the efficacy of library services but also enhances students' ability to access and utilize educational resources effectively. In order to shed light on how AI-driven technologies are altering the role of libraries in promoting academic achievement in educational settings, this research attempts to explore this significant impact.

Advances in artificial intelligence (AI) have propelled the rapid growth of educational technology (EdTech) in recent years. One area where these advancements have a significant influence is on library services in educational technology centres by having vital hubs for learning and research, offering access to vast repositories of knowledge (Ali et al., 2024). Still, the introduction of AI has ushered in a new era of effectiveness and efficiency in numerous fields. Consequently, there are several ways that artificial intelligence (AI) technologies, such as machine learning, natural language processing, and data analytics, are being used to improve library operations. Automated cataloguing systems, for instance, streamline the organization and retrieval of resources, enables librarians to focus more on user engagement and personalized assistance (Ajani et al., 2022). Although, virtual assistants driven by artificial intelligence are always on hand to support students with difficult research projects and quickly respond to enquiries.

Moreover, AI-driven recommendation systems help students discover relevant materials tailored to their academic interests and learning preferences. The role of AI on librarian extends beyond operational efficiency to directly i n f l u e n c e s t u d e n t s ' a c a d e m i c performance. By facilitating easier access to information and fostering a more engaging learning environment, AI empowers students to make better use of library resources. This, in turn, enhances their ability to conduct thorough research, critically analyze information (Lin et al., 2023) and develop insights that contribute to academic success. To fully use artificial intelligence (AI) in educational contexts, instructors, administrators, and legislators must comprehend these interactions. By examining how AI enhances library service efficiency and its subsequent influence on students' academic outcomes. The purpose of this research is to provide light on how to enhance learning opportunities and encourage academic success for leaners in modern times.

Statement of the Problem

Artificial intelligence (AI) being used into library services within Educational Technology Centre's poses both opportunities and challenges for enhancing efficiency and impacting students' academic performance. AI promises to streamline resource

management and improve access to information, its implications for student learning outcomes and educational equity require careful examination. In Nigeria, there have been considerable advancements in the use of electronic environments in the areas of commerce, education, health, and governance. According to Awais & Ameen (2019), just 15% of university libraries have incorporated innovations based on information technology, while 85% are far behind in using the newest technologies in their libraries. There isn't much of an influence on the information technology infrastructure of the libraries, as far as technology-based services and resource utilization are concerned. The willingness of certain university librarians in Nigerian university libraries to adopt robotic technologiesforeducational technology Centre's is quite inadequate according to research by Kehinde et al. (2022).

The fact that librarians have not been able to take advantage of this chance to harness the advantages of a variety of information technology applications each Centre for good communication to increase the academic performance of the students might be one of the causes for the aforementioned failures. The reason for this may be a major factor in the majority of information technology initiatives in libraries failing. Therefore, the attitude of librarians is seen to be the main factor determining the application of artificial intelligence in educational settings, which has an impact on students' academic performance. Several scholars have developed concepts and recommendations for enhancing the use of technology in information for the effectiveness of library services in educational technology Centre's (Bathgate et al., 2019). However, no prior work that examines the impact of library services on artificial intelligence in a comprehensive way has yet been done. The conclusions of this study are expected to provide clarity regarding the outcome of advancements on artificial intelligence. This study aims at investigate how AI technologies in library settings affect service delivery, user engagement, and ultimately, students' academic achievements. Therefore, considering how well technologies powered by AI improve library operations and comprehending how they serve a range of learning demands and academic achievement in educational settings are important concerns.

Library Service delivery

Libraries are built on the core idea of library and information service delivery. Delivering information services and resources to library users with the intention of improving their activities and productivity is the essence of library and information service delivery (Agoh and Omekwu, 2021). This is accomplished via the utilization of library procedures and activities. It is important to realise that the term

"quality service" does not only apply in business settings; libraries and other public service organizations are examples of organizations where this idea is useful. Offering high-quality services is a matter of comparable importance (Al-Ibrahim, 2014). According to Chigbu et al. (2014), cooperative efforts in the development of human resources, financing, power supply, provision of ICT facilities, infrastructure development, and consulting services are essential for Nigerian libraries to have effective service delivery. Thus, lending, user registration, and interlibrary loans are the usual services offered to the section (Abdulhamid & Musa, 2021), and these services were found to be pertinent to the needs of the users. There are a number of reasons why a library may be inefficient in providing high-quality services, including inadequate funding and staffing.

Artificial intelligence

A lot of people are interested by the idea of creating computers or other devices that can think, feel, perceive, and act like humans. People are born with the capacity to observe, reason, and act; this capacity grows and improves throughout time due to a variety of circumstances. The Intelligence Quotient (IQ), which is determined via a battery of aptitude tests covering many facets of intellectual functioning, is used to quantify human intelligence. Omame and Alex-Nmecha (2020) define artificial intelligence as the capacity to reason, acquire knowledge, and use it when needed. Likewise, the essence of artificial intelligence is in creating intelligent machines that think, feel, and act like people. The capacity of computers or other machines to do certain tasks in the face of uncertainty, to monitor their surroundings and modify their behavior accordingly depending on what they perceive to be necessary for intelligence, is referred to as intelligence.

Ex Libris (2019) asserts that because machines are designed to recognize and internalize patterns more effectively on much larger scales than humans, intelligence in them not only allows them to learn, but they are also configured to improve with use to perform functions better without being explicitly programmed into existence. Since its establishment as a field of study in 1956, artificial intelligence has seen many waves of growth and excitement, followed by setbacks and funding cuts (dubbed an "AI winter"), new developments, successes, and increased investment. Since its inception, artificial intelligence (AI) research has explored and abandoned a wide range of strategies, including brain simulation, human problem-solving modelling, formal logic, modelling vast knowledge stores, and mimicking animal behavior. Highly mathematical-statistical machine learning has dominated the subject in the early decades of the twenty-first century, and this approach has shown to be quite effective, helping to solve many

difficult issues in both business and academics.

John McCarthy originally suggested artificial intelligence in 1956 during his first academic meeting on the topic, according to Al Ali and Badi (2021). Scientists started to get obsessed with the concept of creating robots that functioned l ike humans, and mathematician Alan Turing proposed the possibility of giving computers the same capacity for independent thought and learning. By examining the subject of whether "machines can think," Alan Turing was able to put his theories and enquiries into practice. It has been discovered via a series of tests (later dubbed the Turing Test) that it is feasible to give robots the same cognitive and learning abilities as people. The pragmatic method is used by the Turing Test to determine if robots can answer in the same way as humans. The branch of research that explains how machines can learn exactly like people and how they can react to certain behaviours is called artificial intelligence, she went on to say. Every day, there is a growing need for artificial intelligence. Artificial Intelligence (AI) has been the driving force behind the rapid advancement of technology and commercial domains since its initial release. "85% of customer interactions will be managed without a human" by 2020, according to computer scientists' predictions. This implies that basic human requests, like as asking the weather temperature via Galaxy or Siri, will increasingly rely on computers and artificial intelligence. As the UAE has done by appointing a state minister for AI in Dubai, it is crucial to be ready for the disclosure of AI.

Artificial intelligence as enabler for library service delivery

According to Pattinson (2016), technology has developed at an exponential rate in the twenty-first century, and we have reached a point when "the promises of science fiction are fast becoming a workaday reality." An era dominated by artificial intelligence (AI), a group of technologies that can mimic or even surpass work completed by people using computers, has resulted from the enormous developments and increased use of smart technology.

Without a doubt, AI has yielded amazing accomplishments. It implies that jobs that were previously thought to be beyond the capacity of computers may now be automated (Tella, 2020). The integration of AI into library operations and services is expected to be a boon for the whole library community, despite the fact that libraries and librarians have profited greatly from earlier revolutions Al Ali and Badi (2021). All sectors are being impacted by advanced technology, and just as public and private sector stakeholders in the global polity are embracing these technologies, academic libraries should do the same. This will allow them to adjust their services and help meet the

increasing needs of their customers (Ajani et al., 2022). When this is done, cutting-edge technology will therefore automatically transform academic libraries' operations and services from collection knowledge to user knowledge.

Using mobile capabilities to increase data acquisition accuracy, utilizing sophisticated big-data analytics to identify hidden statistical patterns, and utilizing AI techniques to retool information search, collection, organization, and knowledge discovery are just a few examples of the many ways artificial intelligence (AI) is being applied. Ultimately, in this modern technological era, AI systems are currently utilized in a variety of fields to maintain their effect on libraries. Although artificial intelligence (AI) is currently acknowledged as one of the significant cutting-edge information technologies that might be applied in various industries, Nigerian academic libraries are just now beginning to pay attention to it. It's probable that search and resource discovery will be one of AI's biggest effects on academic libraries. In terms of examining a large corpus of data, Cox, (2021) noted possible effects; producing the Fourth Industrial Revolution is now being utilized by libraries worldwide, and they are creating a wide range of technology for various library functions. Therefore, Libraries are becoming more than just lovely book shelves in the 4IR age.

Libraries contain significant print collections in addition to offering an increasing range of digital services and resources. Hence, Robotics and AI systems can assist with the tiresome task of maintaining these quantities in libraries. The fact that certain libraries in developed and developing countries now use artificial intelligence is no longer news. In academic libraries, artificial intelligence (AI) may be used to build metadata, analyze large data, and enhance search translation, according to Fernandez (2016). Using AI in academic libraries would therefore increase the availability and accessibility of the contents there and enable staff members to respond to enquiries from patrons regarding the usage of AI. In order to effectively use artificial intelligence's potential, academic libraries must reposition themselves in the information age and improve the calibre of services they provide. Tella (2020) emphasized this necessity.

Additionally, Talley (2016) underlined that university librarians must use AI technology in order to better serve scholars and other library customers. Many university libraries, especially in industrialized nations, have used artificial intelligence (AI) for a variety of library functions, including circulation and reference services, according to Grant and Wischick (2020). According to Yusuf et al. (2022), user engagement has increased in several industrialized nations due to the

adoption and use of AI. Only in situations where AI is being used to advise and help, and at the same time user-friendly, especially in information search, can access to t imely information take place. For example, an AI that is nice to users will make it easier for them to search for information, get information from different collections, and get assistance with their questions. Comparably, Asefeh and Asemi (2018) enumerate several ways that AI technology might be applied to enhance library services, such as book shelving, circulation, and cataloguing, among other activities.

Moreover, metadata assignment and non-textual search support are provided by AI technology. The application of artificial intelligence (AI) in library operations is highlighted by Fernandez (2016), who points out that these prospects include large data analysis, metadata creation, search item translation, and search item integration across resources. According to Owolabi et al. (2020), Chatbots, machine translation, and self-learning algorithms are just a few examples of the many technologies that fall under the umbrella of artificial intelligence (AI). These tools may help people act more appropriately by helping them comprehend their surroundings.

Businesses have been implementing AI technology advancements in order to maximize their s t rategic and competitive advantages, disrupt their industry, or both. Artificial intelligence (AI) reaches its greatest potential when it can detect, anticipate, and interact with humans in addition to streamlining current procedures and enhancing automation, i nformation, and transformation impacts. Therefore, by leveraging these AI attributes, organizations can increase the business value of their transformed projects. The study's results demonstrated the benefits of AI in organizations, particularly its capacity to improve performance at the organizational (financial, marketing, and administrative) and process levels. Additionally, the same results demonstrated that companies can only leverage AI capabilities to perform better when they reorganize their processes using the features and technologies they have. Barbara & David (2018) states that artificial intelligence is a broad field of computer science that aims to create intelligent computers that possess elements of human intellect. Although it's now one of the most amazing and sophisticated innovations made by humans, the sector has enormous development potential and is yet mostly untapped. There are three categories for AI. These are: Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI)

1. Artificial Narrow Intelligence (ANI)

It is currently the only kind of AI that is accessible, and it is known as weak AI because of its limited skill set. Speech recognition/voice assistants, facial recognition, and autonomous vehicles

allemployartificial narrow intelligence.

2. Artificial General Intelligence (AGI)

Artificial general intelligence also advanced artificial intelligence, is the capacity to replicate human thought processes and attitude in order to address any given issue. Researchers are actively working on making robots more capable of seeing, understanding, and learning much like humans, although strong or deep AI is not yet ready.

3. Artificial Super Intelligence (ASI)

The potential for Artificial Super Intelligence (ASI), a more advanced form of AI, to further enhance efficiency in educational technology centers, particularly in librarian services, presents an exciting area of research. ASI could automate complex tasks, offer predictive data analytics, and provideenhanceinteractive experiences, all of which can significantly improve the role of librarians in educational settings. Figure 1 shows the illustration of the proposed three types of Artificial intelligence to address any issues.

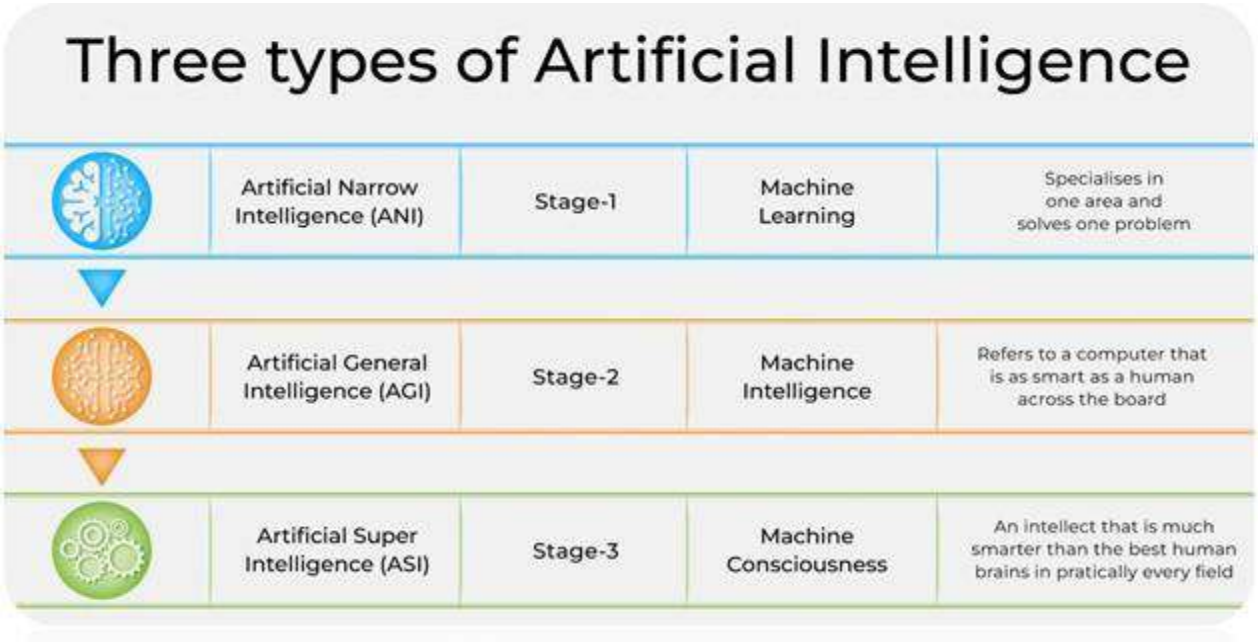

Figure 1 The three types of Artificial Intelligence (Source: Deltalogix)

Problems associated with Artificial intelligence

In the majority of libraries today, artificial intelligence technologies are not in use. Lack of sufficient funding to develop or purchase artificial intelligence systems for libraries is one of the obstacles to the implementation of these systems in libraries, as is the staff's lack of technical expertise in their use and operation (Tundrea et al., 2020). The sort of system the library can design or acquire is constantly limited due to the often-short resources for both

software and hardware; artificial intelligence systems in libraries have significant system development and maintenance costs; these systems, especially in poor nations, are powered by unstable power supplies (Omame & Alex-Nmecha, 2020). In academic libraries across Africa, the smooth adoption of artificial intelligence (AI) is still hampered by a number of issues, including unstable funding, skill gaps that are opening up, job loss, inadequate infrastructure, and inconsistent power supplies (Yusuf & Bello, 2022). Consequently, the literature analysis has demonstrated that there are some obstacles impeding the use of artificial intelligence as a front-desk service delivery mechanism in libraries. In order for educational technology Centre's to successfully integrate AI into libraries, further study is required because Artificial intelligence (AI) is among the most recent technological advancements in digital transformations (DT) that the university library may use to provide users alternate educational options.

In Okunlaya, Syed, and Alias's (2022) study examined innovative conceptual framework for the digital transformation of university education for library services. Therefore, a qualitative content analysis was used to examine the body of literature regarding how the adoption of AI promotes creative services in a range of organizations. In order to assist with AI service innovation and delivery in university libraries, the research also employed content analysis to produce potential solutions. Based on the study's findings, experts created the Artificial Intelligence Library Services Innovative Conceptual Framework (AI-LSICF), which integrates AI functions and applications into the digital transformation's framework elements. The research area has a poor adoption rate of artificial intelligence, according to this literature; however, there is a vacuum to be filled.

Artificial intelligence adoption and successful application are influenced by a variety of factors. Harisanty et al. (2022) employed thematic analysis to analyse the data, and after selecting the 38 participants using a purposive sample strategy, they discovered eight concepts. As executives, practitioners, and scientists had a positive, open, and encouraging approach on AI, the study's findings demonstrated that a variety of perspectives gave library stakeholders complete understanding and enough information to launch AI efforts in Indonesian libraries. This implies that they fully comprehend the potential advantages and difficulties of such projects and are receptive to the notion of integrating AI technology into library operations. Exploring the role of AI on improving librarians' efficiency in Educational Technology Centre's and its influence on students' academic performance reveal significant insights into the intersection of technology and education by improved access to

resources (Al-Aamri & Osman, 2022). AI- powered systems, such as automated cataloguing and recommendation engines, have streamlined access to educational resources. For example, studies show that AI algorithms can efficiently categorize and retrieve relevant materials, thereby enhancing the efficiency of resource discovery for students and educators alike. Moreover, Panda & Chakravarty (2022) ascertained that virtual assistant and chatbots integrated with AI technology provide immediate support and guidance to library users. Research indicates that these AI-driven tools contribute to a more personalized user experience, assisting students in navigating complex information landscapes and facilitating quicker resolution of queries (Vijayakumar & Sheshadri, 2019). Several empirical studies have explored the correlation between AI-enhanced library services and students' academic outcomes. Findings suggest that improved access to curated resources and personalized learning experiences facilitated by AI can positively influence information literacy skills, critical thinking abilities, and overall academic performance.Therefore, AI technologies contribute to operational efficiencies within

Educational Technology Centre libraries through the automation of repetitive processes like data analytics and inventory management. This allows librarians to allocate more time to user engagement activities and instructional support, ultimately enhancing the quality-of-service delivery. A review of the barriers to AI adoption in educational environments found that data privacy concerns, algorithmicbiasin resource recommendations and the need for ongoing professional development for library staff to effectively employ AI technologies. Research has also demonstrated how crucial strategic planningand Organisational preparedness are to the effective integration of AI into library services. Therefore, Organisations that place a highpriorityon stakeholder engagement, training and iterative AI system improvement will be better positioned to fully utilize these technologies in support of educational goals.

Future research is required to focus on addressing emerging ethical and regulatory issues in AI- driven educational technologies, investigating how scalable AI solutions are across various educational contexts and analysing how AI will ultimately impact student engagement and retention. On the whole, empirical reviews by Tella, (2020) highlights the transformative potential of AI in enhancing library service efficiency in Educational Technology Centre's and its profound impact on shaping students' academic experiences and outcomes. These findings provide a robust foundation for ongoing research and informed

decision-making in educational technology integration.

Implications

AI technologies such as automated cataloguing systems and recommendation engines have streamlined resource management processes in libraries. This has led to faster retrieval of information and improved organization of educational materials that enhance overall operational efficiency. Also, AI-powered chatbots and virtual assistants offer students individualised support, guiding them through library resources in an efficient manner. This kind of individualised care has increased user happiness and engagement and made it simpler for students to access and use materials from libraries.

Nonetheless, there is evidence to support the claim that AI-enhanced library services have a positive effect on students' academic achievement by making it simpler for students to access pertinent materials and by supporting personalised learning paths. AI also helps students strengthen their research, critical thinking, and information literacy skills. As a result, AI technologies have made library materials more accessible to a wider range of students in the learning system. Features like text-to-speech capabilities and adaptive interfaces enhance inclusivity and ensure equitable access to educational materials. Nevertheless, concerns over data privacy, algorithmic biases in material selection, and the requirement for continual staff training are some of the challenges that must be solved when incorporating AI into library services. These concerns must be addressed in order to guarantee equitable access to library resources and the moral use of AI.

Conclusion

Artificial intelligence (AI) in libraries within Educational Technology Centres, in its final phase, represents a revolutionary development with significant implications for student academic performance and operational efficiency. AI enables personalised learning pathways, boosts academic achievement through individualised resources, and encourages user satisfaction and engagement. Therefore, Artificial Intelligence (AI) technologies are essential in creating a dynamic and welcoming learning environment. The potential of AI to boost students' academic progress and enhance their educational experiences will be further maximised in the future by continuing investment in AI-driven innovations, together with careful consideration of ethical issues and ongoing professional development. AI technologies significantly contribute to higher levels of user satisfaction among students and educators using library services. This seamless user experience not only simplifies the navigation of library resources but also fosters greater engagement with educational materials. As a result, students are more inclined to

actively engage in their academic journey, make use of library resources, and investigate a variety of learning opportunities. In essence, the ongoing integration of AI into Educational Technology centre libraries holds promisefor revolutionizing educational support services and enhancing learning experiences. Future endeavours should focus on further refining AI technologies, addressing ethical considerations, and fostering collaboration among stakeholders to optimize the impact of AI on educational outcomes.

Recommendations

The following recommendations were made that:

1. Education establishments have to place a high priority on investing in a strong AI infrastructure designed for library services. This includes deployment of advanced AI algorithms for automated cataloguing, recommendation systems, and virtual assistants that enhance efficiency in resource management and user support.

2. Library staff, educators, and students should receive training on data literacy, the ethical application of AI technologies, and how to understand AI algorithms, responsibly interpret data insights, and address algorithmic presumptions, so as to guarantee fair and equitable access to educational resources,.

3. Libraries, educational technology centres, and AI developers should cooperate to jointly build creative solutions that meet the particular needs of teachers and students. Additionally, in order to keep current with developing AI trends and best practices, to cultivate connections with university academics and industry leaders.

4. Instructors should employ adaptive learning technologies, which adjust the way materials are delivered and the ways in which they are supported based on each student's unique learning style. They should also tailor AI applications to the unique learning needs and preferences of each student's skill level and academic objectives.

5. Robust data protection measures and protocols to safeguard user privacy when deploying AI technologies in library services should be implemented.

6. Educational institutions should encourage a culture of innovation and experimentation within Educational Technology centres and libraries and support pilot projects and initiatives that

explore novel applications of AI, such as predictive analytics for student success or AI-driven content curation for personalized learning experiences.

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AN APPRAISAL OF THE LEGAL FRAMEWORK FOR COMBATING CHILD LABOUR IN NIGERIA

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Abstract
The discourse on child labour has generated global attention leading to enactments of both international conventions and domestic laws to combat the menace. International organisations such as United Nations International Children's Emergency Fund (UNICEF) were established to fight against child labour among other things. However, the meaning and scope of child labour remain unsettled among scholars and policymakers. This is because there is no universally acceptable benchmark for a child and the scope of work regarded as child labour varies from one society to another. The aim of this paper was to review the concept of child labour in relation to international and domestic laws enacted in curbing child labour in developing countries and the causes and effects of child labour so as to know the effectiveness of these legislations in combating child labour. Based on the review of literature, it is recommended that child labour can be curbed, if government at all levels put in place policies to reduce poverty in the society. Effective administration of the various legislations is equally advocated for in ensuring that these legislations are well implemented with the view of curbing the menace which is capable of destroying the future of the child.

Keywords: Child, Child Labour, Child Abuse, Legal Framework, Nigeria

Introduction
Child labour is a general menace that occurs all over the globe. As a crime, it involves gross violations of human rights and threatens the survival and development of a child. It is not

debatable that children need special care, attention and protection and are dependent on the help and assistance of an adult to survive especially in the early years of their existence. Under the International Human Right Laws, children are considered to be among the defenceless and vulnerable group and therefore, the need to be protected by the State through the instrumentality of the law. It is widely believed that children are not capable of protecting themselves.

Due to the above, the international community have come up with various instruments and treaties to protect the child and among the rights enjoyed by the child is the right against child labour. It has been observed that Nigeria economy is beclouded with high rate of unemployment but the obvious truth is that the rate of unemployment is not as high as envisaged rather, the labour sector is filledwith employees with unsustainable income as wages. This is partly due to the rate of inflation in the country, recessions in the economy, and overbearing of investors and capitalists. Nigeria economy is saturated with a lot of informal investment and these investments encompassed a reasonable numbers of employees which are largely unregulated.

The informal sector of the labour market which is largely unregulated accounts for the reason for the prevalence of child labour in Nigeria. Travelling across cities in Nigeria, one will note that Nigerian children are used for marketing products even on the high ways, while others engage in hawking on the street. Very few formal industries employ children because of the attendant consequences. Despite several laws prohibiting child labour and abuse in Nigeria, this ugly menace persists on daily basis without any iota of fear and reprimand. It is therefore worrisome the rate at which children are being abused on a daily basis.

There seems to be two schools of thought in respect of child labour. Some school of thoughts opined that child labour is not anti- development to a child, it is a way of teaching the child the value inherent in labour so as to build a virile and energetic youths who believe in the dignity of labour. Child labour inculcates in the child the sense of hard work as a panacea to success. This position is mostly canvassed by the traditional African society. It is supported by the Yoruba poem “Ise Logun Ise” (work is the Antidote for poverty).

Another school of thought opined that exposing a child to labour is nothing but an abuse. A child should be catered for byhisparent, guardian and government. Children are categorized as vulnerable. This is because children at work are prone to various forms of abuse which is capable of demoralizing the psychological development of the

child. The formative age should be guided so as to build a society with a balanced adult. To support this view, Folami argued that the free economic system has created the opportunity for chil exploitation in modern Nigeria. He also noted that children are now the tools of income generation for the parents.

Abba writes that every child has right to life and if so, it is a responsible parent that could make this workable and realistic to uphold the children's right and existence to life. Time is now ripped for society to look into any children's right.

This paper extensively discusses the laws promulgated for the protection of a child from labour and why this menace persists in the Nigeria economy. The authors shall maintain a different position from the above two school of thought to the effect that child labour should be properly situated within the context of the definition of who is a child and what is the meaning of labour. A critical and constructive definition of the two concepts will help to fight against the menace without any form of cultural sentiment and prejudice. The effects of child labour will also be examined and useful recommendations will be discussed on how to eradicate child labour.

Conceptual Clarification

Who is a child? The definition of a child within the purview of the statute has generated some controversy and suffice it to say that there is no equivocal definition of whom a child is. Various statutes define a child for the purpose of which they intend the definition for. This does not augur well most especially for the topic at hand. This is because the meaning of child labour will not be adequately comprehended where the concept of a child and labour is not settled.

Be that as it may, the Child Right Act which is the main statute in respect of a child's right defines a child as any person under the age of 18 years. The Convention on the Right of a Child defines a child as every human being below the age of 18 years unless under the law applicable to the child, majority is attained earlier. From this definition of a child by the above convention, it shows that anybody above 18 years cannot be regarded as a child but persons below 18 years can still be regarded as not being a child if the local legislation permits same.

According to the Labour Act, it defines a child as a young person under the age of 12years. However, the Children and Young Persons Act define a child to mean a person under the age of fourteen years while young person means a person who has attained the age of fourteen years and is under the age of seventeen years. The Immigration Act provides that any person below the age of sixteen years is a minor whereas Matrimonial Causes Act 1970 puts the

age of maturity at 21 years.

From the above definition, it is difficult to actually ascertain the scope of a child. However, the Child Right Act put to rest the controversy. The Act provides that:

> The provision of this Act supersedes the provision of all enactment relating to children, adoption, fostering, guardianship, wardship, approved institution, remand centres and borstal institutions and any other enactment pertaining to children already provided for in this Act.
>
> Where any provisions of this Act is inconsistent with that of any of the enactment specified in subsection (1) of this section, the provision of this Act shall prevail and that other provision shall, to the extent of inconsistency, be void.

It is not clear whether the court will be moved to declare void the provisions of the Labour Act in respect of the definition of a child in line with the above proviso. This is because the issue of labour is not specifically mentioned though issues relating to children are stated therein. But it seems to me that the provision of the Labour Act ought to be declared null and void in the light of the above provisions of the Act.

Labour, on the other hand, is any work done to earn a living or to achieve other purposes. This definition will no doubt encapsulate domestic work such as house chores, apprenticeship, agricultural work etc. The above definition of labour is elastic and all encompassing. It is on this basis that we are going to examine some definitions of child labour.

According to UNICEF and ILO, child labour is any work that a person engages at full time at too early an age (says 5-14) and work too many hours or when the work puts excessive physical, social and psychological strain on the person and hampers the person's development in these areas. This definition is carefully selected with the view of not compromising the socio cultural background of the people most especially Africans. This is because the definition does not out rightly captured all labour done by a child as child labour but where the labour is for too long a time and capable of affecting the child from enjoying his or her childhood. Therefore, domestic work, light agricultural work, and apprenticeship are not within the above contemplation. There seems to be a lacuna in this definition. There are some other light labour which may not affect the development of the child and which may not take a too long a time but which is capable of exposing a child to abuse because a child is defenceless and vulnerable. This kind of labour

includes: hawking after school hours, working as shop keepers, bar and restaurant attendant, etc.

From the foregoing, it is pertinent to distinguish between child labour and child work. It is not very work done by a child that can be regarded as child labour. Child's involvement in an activity that does not affect their well being and development or interfere with their education is generally referred to as child work which is commendable. These forms of child work include: assisting their parent in house chores and family business, or earning stipend outside school hour or while on holiday, apprenticeship etc. These kinds of work may promote child's development and provide them with the expertise which helps them to be responsible members of the community.

Ugal and Undyandeye noted that child labour is any work that is essentially exploitative and injurious to the physical, social, cognitive and moral development of the child. It involves young persons who are exposed to long hours of work in a dangerous or unhealthy environment with too much responsibility for their age and at the expense of their schooling.

The term child labour can also be referred to as any work that deprives children of their childhood, potentials and their dignity and which is harmful to their wellness and mental development. It refers to:

> Any work that is mentally, physically, socially or morally dangerous and harmful to children; and
> Any work that interferes with their schooling by depriving them of the opportunity to attend school, oblige them to leave school prematurely; or requiring them to attempt to combine school attendance with excessively long and heavy work.

In my humble opinion, child labour is any labour that is inimical to the interest of a child whether it is domestic or not and which may hamper the physical and psychological development of the child.

Forms of Child Labour

Child labour can come in various forms but for the purpose of this section, child labour will be categorised into two namely:

a. Socio Cultural Driven Child Labour.
b. Economic Driven Child Labour.

Socio cultural driven child labour: also known as non- hazardous child labour, is a child labour that engages child in activities that are beneficial to the general development of the child. It is believed to be part of socialization process of a child which has a positive effect on the child. It includes: house chores, apprenticeship, light

agricultural work, domestic work, Economic Driven Child Labour: It is a hazardous child labour and these are child labour that aims to exploit the childhood of a child with the ultimate aim of making economic advancement on the part of the employer. This kind of child labour has mental and social effect on the child. It is regarded as the worst form of child labour that is highly detrimental to the general well being of a child. It includes Child Prostitution, Child begging, Child Trade, Industrial Labour, House Maid/Domestic Servant, Hawking, Slavery, forced labour, work in mines and quarries etc.

Causes of Child Labour

There are various factors that can lead to child labour but the principal one is poverty. Where the people find it difficult to make ends meet or where survival is highly competitive, child labour is probable to occur. This is because a child is categorised as a dependant who is expected to depend on his or her parent for survival. Where the parents find it difficult to meet up with expectation, one of the means that will be resorted to is exploiting the child so as to maximize the chances of survival.

Another factor that leads to child labour is the irresponsibility on the part of some parents who do not see it as a duty to ensure the adequate care of their children thereby exposing these children to various forms of abuse. This is so because of the lack of political will to ensure the protection of children through the instrumentality of the law. Parents should be compelled as a matter of fact, to take care of their children.

Another cause of child labour which is worthy of mention in Nigeria is cultural and religious value. This is commonly experienced in the northern part of Nigeria. The concept of Almajiri is a religious value that exposes children to various forms of abuse including child labour.

On the part of the government, failure to ensure adequate guarantee of the child's right has led to child labour. Government's programme and policy should be geared towards the protection of the vulnerable in the society. Another major cause of child labour is natural occurrence forthwith the death of the parent. Other causes are: disintegration due to dissolution of marriages, rapid urbanization, war and civil strife, lack of birth control, economic downturn and overpopulation.

Legal Framework for Child Protection

Various laws are promulgated to protect a child's interest. These laws adopt the best interest of a child as the basis upon which the legislations were made. However, this chapter shall discuss these legislations that protect the child from child labour. The legal framework will be discussed under the international and domestic legislation. International legislations are: Convention on the Right of a Child and African Charter on

the right and Welfare of a Child. Local legislation are: 1999 Constitution, Child Rights Act, and Labour Act,

International Legislation

Convention on the Right of a Child (CRC): The UN Convention on the Right of a Child is an international instrument which deals with the rights of a child. This convention provides for variety of rights for the child and the driving force behind this convention is the best interest of a child. Looking at the instruments, the various rights provided show that children are expected to depend on their parent and the government for survival. However, the Convention did not categorically abrogate child labour. Article 32 provides that:

> States parties recognize the right of the child to be protected from economic exploitation and f rom performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development.
>
> ... States parties shall in particular provide for a minimum age or minimum ages for admission to employment, appropriate regulations of the hours and conditions of employment...

Similarly, Article 36 provides that "you have the right to protection from any kind of exploitation i.e (being taken advantage of).

From the provision of this law, it is obvious that States parties are given the discretion to determine what amounts to child labour. The law did nothing to protect the child from child labour as there is no decisive proviso in respect of it. This is because the right provided for in paragraph 1 of the Article is taken away in paragraph 2.

The Convention further provides that "

> States parties shall refrain from recruiting any person who has not attained the age of fifteen years into their armed forces. In recruiting those who have attained the age of fifteen years but who have not attained the age of eighteen years, States Parties shall endeavour to give priority to those who are oldest.

According to Aare and Iroye, the Convention on the Right of a Child does not call for prohibition of child labour but for prohibition of labour which is hazardous or likely to interfere with the child's education or development. One will expect that the Convention should do more by prohibiting all forms of labour which is inimical to the best interest of a child. The approach adopted seems to be too liberal.

African Charter on the Right and Welfare of the Child: the Charter is an African regional human r ight legislation adopted by the African Union (A.U) on the 11th July, 1990. According to the Charter, persons under the age of eighteen years are regarded as a child. The Charter further provides that the best interest of a child shall be the primary consideration in all action concerning the child.

Article 15 provides for that children should be protected from all forms of economic exploitation and from performing any work that is likely to be hazardous or to interfere with their physical, mental, spiritual, moral, or social development. The charter seems to be in tandem with the Africa culture by totally prohibiting all forms of economic driven or hazardous child labour but it preserves social driven child labour.

Domestic Legislation

1999 Constitution: the Nigerian Constitution provides for various justiceable rights which are aimed to protect its citizens including children. These rights are contained in chapter IV (sections 33- 44) of the Constitution. Section 34 is very relevant to protection of child labour. It provides that:

> *Every individual is entitled to respect for the dignity of his person and accordingly: no person shall be subjected to torture or in human or degrading treatment; be held in slavery or servitude; and no person shall be required to perform forced or compulsory labour.*

Child's Right Act: the Act makes elaborate provision for the protection of the rights of a child in Nigeria. Section 28 of the Act provides that

> *No child shall be subjected to any forced or exploitative labour; or employed to work in any capacity except where he is employed a member of his family on light work of an agricultural, horticultural or domestic character; or required in any case, to lift, carry or move anything so heavy as to be likely to adversely affect his physical, mental, spiritual, moral or social development ; or employed as a domestic help outside his own home or family environment.*
>
> *No child shall be employed to work in an industrial undertaking and nothing in this subsection shall apply to work done by children in technical schools or*

> *similar approved institutions if the work is supervised by the appropriate authority.*

The Act goes further to criminalize the contravention of the above section on punishment for conviction for imprisonment for the period of five (5) years or fine of fifty thousand Naira or both. Further to this, the Act states that

> a child shall not be used for the purpose of begging for alms, guiding beggars, prostitution, domestic or sexual labour or for any unlawful or immoral purpose, or hawking of goods or services on main city streets, brothels or highways or for any other purpose that deprives the child of the opportunity to attend and remain in school.

The approach of the Act to concept of child labour seems to be more radical and comprehensive. The Act prohibits economic driven child labour but permitted the light work of agricultural, horticultural and domestic work which is a socio cultural driven child labour. Apart from the prohibition, it went ahead to prescribe adequate punishment for would be offenders. This shows a zero tolerance of the Act to the concept of the child labour. Paradoxically, the extent to which the proviso is implementation shows that the Act is nothing but a shadow of itself.

Labour Act: the Act regulates various forms of employer- employee relationship. However, the Act makes provisions for the prohibition of a child labour. Section 59(1) of the Act provides that:

> No child shall be employed or work in any capacity except where he is employed by a member of his family on light work of an agricultural, horticultural or domestic character or be required in any case to lift, carry or move anything so heavy as to likely injure his physical development.

Child Labour and Globalization

Child labour has been a phenomenon across the globe most especially the developing countries. It however emerged as a global issue because multinationals in developed countries take advantage of cheap labour in developing countries owing to child labour. The image of multinational corporations closing their plants in developed countries to take advantage of low labour standards, including child labour in developing countries.

There are arguments that globalization contributes to child labour while others argue that globalization is a panacea to child labour. Edmonds opined that globalization and child labour interacts in two ways. It may increase the

employment and earnings opportunities available to poor household in developing countries. Secondly, it may increase the influence of rich countries in the domestic policies of the developing world.

Neumayer and Soysa concluded that with high incomes, impoverished households are in better situations and consequently, they do not send their children to work anymore. From the above, it shows that globalization can be used to eradicate child labour. In another vein, it can be said that child labour can be traced to industrialization brought about by globalization. This led to children participating in factory work partly due to shortage of manpower and maximizing of profit through cheap labours. According to Maskus, he finds that because of trade liberalization, the export sector has been raised; this increases the demand of child labour and their wage.

Looking at the above two views, it seems that globalization does not in anyway contribute to child labour. This is because the rate of child labour in the formal economy, i.e industry, is very rare compare to the informal economy.

Socio- Legal Effects of Child Labour

One of the socio- legal effects of child labour is that it breeds moral decadence which may eventually leads to increase in crime rate in any society. This is because children under labour are exposed to various forms of menace which may affect them psychologically and sharpen their perspective about the society. The formative age of a child is very paramount and significant and will also determine the kind of adulthood we have in the society. Child labour is capable of breeding touts in the society as most children exposed to child labour eventually become useless and of no meaningful impact in life because of low self esteem. Most of these children learn all sorts of social vices and are exposed to petty crime by virtue of their relationships and interactions with their uncensored environment.

Child labour deprives children of their educational life. It violates children's right to education thereby leading to loss of self esteem. A child that supposes to be in school but was sent to hawk will be denied of his right to education. Even if such a child is sent to school, there is every tendency that such a child will not adequately comprehend what he or she is been taught. Whenever the rate of child labour is high, the level of illiteracy will be high which is inimical to the spirit of development of a society. It deprives a society of her potentials and human resources.

Another effect of child labour is that child abuse is a product of child labour. A child subjected to child labour is immune to various forms of child abuse which includes child neglect, sexual abuse, emotional and economic abuse. Child abuse within this content means an act which leads to violation and

maltreatment of the child whereas child neglect is act of disregard and omissions which harm or adversely affect the health and development of a child. Child labour leads to loss of dignity of a child. It makes the child less inferior to his colleague and makes the child dependent of his own capability.
In the olden days, the concept of child labour took a different dimension. This is because children of those days were exposed to labour either on the farm or in the market place. Children contribute greatly to the economic support of the family and it seems the labour has a lesser effects on the children. One may be tempted to argue that child labour then contribute to the well being of the society socially and economically.

However, looking at the period in question, it seems that the level of civilisation and education is still very much low. Also, the effects of such is not different from now but may not be manifestly noticed due to the fact that civilization is on the low side. It is not a correct position that there are no forms of child abuse occasioned by child labour but most of these abuses are regarded as a normal situation. Though children should not be over-pampered, they must not however be subjected to street hawking, industrial labour, child prostitution, or any other forms of economic driven child labour. Children can be exposed to light work such as domestic work, or agricultural work that is not inimical to their development. The essence of such exposure should be to enable them acquire skills and not to make money.

Conclusion

The phenomenon such as child labour, child trafficking, and other forms of abuses require government to put in place reformations bearing in mind the reconciliation of traditional and modern values system. It is evident that most of these societal ills have strong tie with customs and traditional beliefs, hence they cannot be tackled only from legal perspectives without exploring the possible challenges and the attendant consequences.
Despite the above fact, laws are promulgated to protect children from various kinds of abuse including child labour, the execution of these laws has made the issue of child labour a myth far from reality. Child labour persists in Nigeria despite the various international and domestics laws in place to combat child labour.

Beyond legislation, child labour can be combated where there is good economic policy that reduces poverty among the people and improve the standard of living. One thing that law and policy maker should be aware of is that the law as a tool for social engineering should take into cognizance the custom of the people so as to ensure that such laws are easily obeyed. This will amount to putting a round pole in a round hole. Effort should be made at ensuring that Nigerian children are no longer used for marketing of products on the high ways

by criminalizing such act..

Recommendations

From the foregoing, it is therefore recommended thus:

- ✓ The economic driven child labour should be prohibited as done by the Child Rights Act. Also, other forms of socio cultural child labour that may affect the psychological, physical and mental development of a child should also be prohibited.

- ✓ Government at all levels should ensure the eradication of poverty or reduce same at the barest minimum.

- ✓ Government should create an agency that will be saddled with the function of protecting the rights of a child as enshrined in the Child Rights Act. The rights of a child as contained in the Child Rights Act should be made justiceable by creating effective and efficient agency that will implement the rights contained in the Act and other enabling laws and regulations in that regard.

- ✓ Public campaign and enlightenment should be vigorously undertaken to sensitize the general public of the effect of child labour. Government should strive to eradicate illiteracy.

- ✓ Less privilege children and orphans should be given financial aids and assistance so as not to expose them to various forms of abuse.

- ✓ Availability of child education will also help to curb child labour. Every child should be entitled to education at least up to secondary education level.

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Sociological Factors as Predictors of Drug Abuse among Basic Science Education Students in Tertiary Institutions in South West, Nigeria

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Abstract

The purpose of this study was to investigate sociological factors as predictors of drug abuse among Basic Science education students in tertiary institutions in south west, Nigeria. The population of this study included all Basic Science education students enrolled in public tertiary institutions in South West Nigeria. The sample for this research included 1,350 Basic Science Education students selected through a multistage sampling procedure. A self-designed and validated questionnaire with a reliability coefficient of 0.89.was the instrument for data collection in this study. Data were analyzed using descriptive and inferential statistics, with a significance threshold of 0.05. The study revealed that the occurrence of drug abuse was moderate. It also found that the level of drug abuse among Basic Science education students in tertiary institutions was not significantly influence by parenting style. However, it was significantly influenced by residential location and peer group. The results suggest that educational stakeholders should make coordinated efforts to eliminate the increasing prevalence of drug addiction among students in higher institutions.

Keywords; Basic Science Education Students, Sociological Factors, Drug Abuse, Parenting Style, Peer Group

Introduction

It is impossible to exaggerate the significance of science and technology in the development of any nation. Science and technology have become so valuable that any society or nation that lacks them is at risk of being isolated from the rest of the world due to the global reliance on their methods and outcomes in all spheres of human. Science and technology have contributed to the elucidation of natural phenomena, such as rainbows and lunar eclipses, which were previously associated with witchcraft and malevolent spirits. This has also relieved society of the constraints of superstition (Oniya et at, 2022).

Science education is the sole way of attaining scientific literacy, which is indispensable for a nation to maintain its technological and scientific viability. Students' comprehension of physical

and natural resources in their surroundings and the cultivation of skills for their optimal utilization are facilitated by scientific knowledge, which is why it is imperative that they acquire scientific principles, facts, values, and norms through science classes. The teaching of science subjects, including Basic Science, Biology, Physics, and Chemistry, is necessary to accomplish the focus of science education.

The primary objective of Basic Science Education as a course in tertiary institutions is to cultivate proficient educators who can effectively instruct Basic Science students at the primary and secondary school levels. In spite of the significance and prominence of Basic Science in the advancement of science, technology, and the economy of a nation, which is primarily dependent on the dedication and efficacy of Basic Science students. The researcher has noted that the extent to which students in tertiary institutions are engaging in drug abuse is increasing, which may be due to social factors which could have a negative impact on the quality and performance of Basic Science Education students which are produced annually in Nigeria.

Chemical substances that have the potential to alter the functioning of the body and mind are referred to as drugs. Furthermore, it may be defined as a substance that has the potential to alter the biological function of the body through its chemical actions. Some examples of pharmaceuticals include: tramadol, codeine, morphine, cocaine, amphetamine, methamphetamine, heroin, tranquilizer, paracetamol, cough syrup, mandrax, barbiturates, marijuana, duloxetin, trazodone hcl, tremfya, tresiba, and triamcinolone. Drugs have been utilized by humans for centuries in a variety of societies to alleviate pain, escape from disagreeable realities, alter perceptions, and induce pleasurable sensations, provided that they are used correctly or in accordance with the prescription of medical professionals (Dion, 2014). Drugs can be abused when individuals consume them to achieve a "high," which refers to the sensation of illusory confidence, rather than to treat a medical condition and adhere to a doctor's prescription and instruction. It is possible to abuse cough or cold medications purchased from a store if the instructions are disregarded and an excessive amount is consumed. Overall, it appears that substance abuse continues to be a significant health issue on a global scale.

Drug abuse can be defined as the improper or inappropriate use of chemical substances that have the potential to alter the functions of cells in the body. According to Alimi and Olayiwola (2015), drug abuse is the excessive and persistent self-administration of drugs without consideration for medically or culturally acceptable patterns.

According to Dion (2014), a drug is considered to be abused when its use is not pharmacologically necessary, particularly when it is used in violation of legal prohibition or when a socially permissible beverage is consumed in excess.

An excessive and persistent self-administration of a substance without regard to the medically or culturally recognized patterns is referred to as "drug abuse" Haladu (2014). The use of a substance to the extent that it disrupts an individual's health and social functioning could also be considered. To Dion (2014), drug abuse is the use of a substance that is not prescribed by a medical professional and that could potentially disrupt a healthy and productive life. According to Manbe (2018), substance abuse is the excessive, maladaptive, or addictive use of narcotics for non-medical purposes.

According to Faluyi (2023), drug abuse is defined as the excessive dependence and exploitation of a specific substance, regardless of whether a qualified health practitioner has previously diagnosed the individual. In addition, they identified a number of hazardous substances that are frequently abused by adolescents, including cocaine, Indian hemp (marijuana), morphine, opium, tobacco, ephedrine, valium five, and Chinese capsules.

People utilize narcotics for a variety of motives, including the desire to experience pleasant feelings. Drugs may induce a temporary sense of emotional stability. The reason individuals continue to consume them may be due to the desire to experience those pleasant emotions on an ongoing basis. Although an individual may consume an increasing quantity of a substance, the positive emotions generally do not persist for an extended period. It appears that certain individuals who experience intense feelings of anxiety, fear, or sadness resort to substance misuse in order to alleviate their anxiety and depression. This does not appear to be a significant solution to their issues and may result in addiction, which could ultimately exacerbate their distress. Individuals who aspire to improve their academic performance, secure a more lucrative position, or increase their income may believe that medications will enhance their energy levels, keep them alert, or facilitate their cognitive processes. This approach may not be effective, but it could potentially result in addiction and jeopardize their health.

Undisputed facts are the prevalence of substance addiction among adolescents and the detrimental consequences it has on their personal lives, careers, and health. Because of the country's inadequate security system, bribery and corruption, and the loss of parental control over children, narcotics are becoming increasingly accessible. Consequently, younger individuals are consuming alcohol and illicit drugs,

such as marijuana, cocaine (crack), heroin, hallucinogens, inhalants, and any prescription-type psychotherapeutic drug that is used non-medically. In essence, the "Forbidden Fruit Theory" posits that youths frequently experiment with narcotics, despite the fact that God instructed Adam not to consume the apple and parents warn their children not to smoke and drink. Nevertheless, youths have a tendency to follow the rules (Njeru & Lewis, 2014).).

Young people appear to be intoxicated as a result of their use of substances such as cannabis, alcohol, and snuffing drugs. The assumption is frequently made that adolescents progress from legal to illicit drugs and from less severe to more severe drugs. Drug abuse is the intentional ingestion or use of drugs for purposes other than their intended purpose without the guidance of a physician or medical professional. Particularly among students in tertiary institutions, drug abuse appears to be prevalent, and drug dependence has imposed a substantial burden on both individuals and societies worldwide. In Nigeria, substance addiction appears to be becoming more prevalent, and a significant portion of the national budgetary allocation for health is allocated to the treatment and rehabilitation of drug users. In both urban and rural areas, the consumption of cannabis is widespread (10.8%), followed by psychotropic substances (primarily the benzodiapines and amphetamine-type stimulants) (10.6%), and to a lesser extent heroin (1.6%) and cocaine (1.4%), as indicated by the various situation assessments of drug abuse and addiction in the country (Odejide, 2014). The use of volatile organic solvents (0.53%) is reported to be increasing in prevalence, particularly among the youth, he further stated.

Students in higher Institutions were observed by the researcher to be imitating their peers and acquaintances by using narcotics In Ekiti State. They consume drugs with the intention of developing a sense of inclusion within a peer group or preventing expulsion from the group. A propensity to engage in substanceaddiction may be demonstrated by innocent adolescents. In Nigeria, alcohol and alcoholic beverages, including local ales, palm wine, and the local gin known as "Ogogoro," as well as imported spirits (wine, cognac, and whisky), are observed to be consumed by various population subgroups, with adolescents being the most prevalent users. Other substances that are frequently employed include tranquilizers, psychostimulants, and Indian hemp. The prevalence of drug addiction among young people, particularly in Nigeria, has reached an alarming new level worldwide.

In tertiary institutions in South West, Nigeria, the researcher observed that drug consumption on campus is prevalent. Students who were interviewed reported that they took drugs to gain the confidence to date the opposite sex, a task that most of them are

unable to do without the use of certain drugs. This indicates that the timid individuals intentionally consume certain medications, particularly during social gatherings, in order to achieve a sense of superiority. The researcher also noted that the students' motivations for consuming drugs include the desire to replicate the behavior of adults, improve their circumstances, experience excitement, emulate their peers, and mimic celebrities.

These students' academic performance may be progressively impacted by the abuse of these drugs, which can lead to addiction. This can also result in a variety of negative behaviors on campus and in the broader community, such as the frequent occurrence of traffic accidents as a consequence of the substances' harmful effects. In addition, certain students engage in examination malpractices, while others experience examination-related breakdowns, which result in failure and eventual dropout. Some students become rude and arrogant toward their parents and lecturers, occasionally causing riots and chaos on campuses while some students mature into criminals in society, resulting in their imprisonment.

In light of the aforementioned, it is imperative to conduct research on the sociological aspects of substance abuse among tertiary students. Drug abuse can be either improved or hindered by social factors (Alimi and Olayiwola, 2015). Social factors pertain to the manner in which individuals interact with one another within society. The sociological factors of substance abuse that were examined in this study were parental style, peer group, and residential location. To put it differently, this study investigates the role of sociological factors in predicting drug abuse among undergraduates in fundamental scientific education at tertiary institutions.

The environment may play a significant role in determining whether the children reared within it will develop into responsible and well-adjusted adults. The family, as a social entity, serves as the primary socialization agent for the infant. Following the family' s instruction, children acquired knowledge and were shaped. In the eventthatthe father-mother relationship, which is typically instrumental in the proper upbringing of a child, is not cordial, the children in this family may develop negative behaviors. Normal variations in the nurturing of a child are what is referred to as parenting style. The act of parenting appears to be multifaceted, as it encompasses specific behaviors that can influence children at home, potentially leading to drug use and, ultimately, drug abuse. Children's initial exposure to health is through their families and homes. The family is composed of numerous members, including a father, mother, sisters, siblings, and usually aunts, uncles, and

other close relatives. As a result, it appears that parents have the most significant impact on their offspring. In an effort to conform to the societal norms and customs, parents shaped their offspring.

The manner in which parents use effective discipline and supervision techniques would significantly contribute to the identification of substance abuse among their children. Frequently, children are empathetic toward the attitudes, behaviors, and emotions of their parents and supervisors. It is a prevalent awareness among children that their development is influenced by both themselves and their parents. The family arrangement can also result in issues, (Hollist, Lorine, and Lornie 2019).

Models of behavior in all areas, particularly among juveniles and adolescents, are presented to members by peer groups. It is acknowledged that peer groups are the most significant factor in the predisposition of young individuals to substance abuse. Alimi and Olayiwola (2015) asserted that peer groups serve as a resource for relaxation, entertainment, and reinforcement. Drug use is considered fashionable in certain communities. Peer organizations offer social support and provide ongoing feedback regarding human behavior. This is the reason. They create a sense of security by uniting themselves and emphasizing their independence from their parents. Many youthful, well-known individuals advertise themselves through electronic and print media, including radio, periodicals, and television, in a manner that may encourage individuals to begin smoking. Upon receiving such an initial stimulus, the subject may desire to emulate the behavior depicted in the advertisement, which can result in them smoking a variety of substances, particularly when they observe individuals they admire using drugs. Individuals seems to acquire knowledge by imitating others. He also observes that in Nigeria, young people acquire the ability to commit crimes through this method. The behavior of undergraduates may be either positive or negative as a consequence of peer pressure, which may ultimately contribute to either positive or negative outcomes. It suggests that there is pressure to conform to societal norms, rather than to engage in deviant behaviors such as substance addiction, when it results in negative implications. This gives rise to individuals who are criminally inclined or non-conforming in society. Peer pressure appears to have the most significant impact on undergraduates in terms of cigarette usage, alcohol consumption, and substance use.

A residential location is a setting in which a child resides and is in the care of either their parent or supervision. This appears to be a contributing factor to the substance addiction of children, particularly in environments where

smokers are present, regardless of whether the residence is rural or urban. At times, the environment plays a role in the development of a child's behavior or disposition toward situations and addiction. This implies that pupils from areas where it is permissible to consume alcohol are more likely to develop alcoholism. Concerning the impact of domicile location on the substance abuse of students, the researcher focused on rural and urban areas. For instance, G31; a student who resides in an urban area near alcohol establishments or relaxation centers may be susceptible to substance abuse. Ogbemudia and Aiasa (2015) therefore maintain that the physical and psychological conditions of the residential location have an impact on the substance addiction of students. Based on the foregoing, the study investigated sociological factors as predictors of drug abuse among Basic Science education Tertiary institutions undergraduates in Nigeria.

The research has the potential to be highly beneficial to tertiary institution undergraduates, Basic Science lecturers, school administrators, government, parents, medical personnel, and counselors. This research would furnish students who are currently involved in drug abuse or who have the intention of doing so with information regarding the impact of drug abuse.

The results of this study will also provide Basic Science lecturers with an understanding of the extent to which students are involved in drug abuse. This will enable them to integrate the teaching and learning process with a campaign to reduce drug abuse.

The results of this research would be beneficial to school administrators in their comprehension of the various reasons why students abuse narcotics. Additionally, the results of this investigation may assist counselors in devising strategies that they can implement within their respective tertiary institutions to mitigate the prevalence of substance abuse. It may also help them to initiate initiatives that would mitigate drug abuse among students in tertiary institutions.

The results of this study would assist the government in the development of policies and procedures that are designed to reduce the prevalence of substance abuse and its adverse effects among students. The results of this research would be beneficial to health professionals, including medical physicians, psychologists, and other specialists, as they will subsequently be able to deliver lectures to their patients regarding the hazards of substance addiction. It could also provide them with an advantageous position to identify the most effective treatments for substance abuse victims.

The research would serve as a valuable addition to the current body of knowledge regarding substance abuse and could serve as a source of reference data for students and researchers in the

fields of Basic Science Education and Guidance and Counseling. The empirical results of this research will serve as a source of secondary data and reference material, thereby contributing to the field of knowledge.

Study Boundaries

The research was restricted to the examination of sociological factors as predictors of substance abuse among Basic Science education students in tertiary institutions in South West, Nigeria. Basic Science Education pupils in tertiary institutions in Nigeria were restricted to parental style, peer group, and residential location as sociological factors. Additionally, the investigation was restricted to public universities and colleges of education in the South West region of Nigeria.

Purpose of the Study

The purpose of the study was to investigate the sociological factors as predictors of drug abuse among Basic Science education students in tertiary institutions in South west, Nigeria.

Specifically, the study was to:

a. examine the prevalence of drug abuse among Basic Science education students in tertiary institutions in South west, Nigeria
b. investigate whether drug abuse among Basic Science Education students in tertiary institutions will be significantly influenced by their residential location, parenting style and peer group.

Research Question

One research question was raised in order to guide the study:

What is the prevalence of drug abuse among Basic Science Education students in tertiary institutions in South west, Nigeria?

Research Hypotheses

Three research hypotheses were postulated for the study;

1. Drug abuse among Basic Science education students in tertiary institutions will not be significantly influenced by their residential location.
2. There is no significant difference in the level of drug abuse and parenting style among Basic Science education students in tertiary institutions.
3. Peer group will not significantly influence the level of drug abuse among Basic Science education students in tertiary institutions.

Methodology

This study used a descriptive research design of the survey type. The design is deemed suitable since it enables the acquisition of information from a representative sample of the population in their current real-life circumstances. The population included of all students pursuing Basic Science Education at public Colleges of Education and Universities in the South West region of Nigeria. The South West region of Nigeria comprises the following states: Lagos, Ogun, Oyo,

Osun, Ondo, and Ekiti. The research sample included 1,350 undergraduate students enrolled in Basic Science Education programs at 12 public tertiary institutions in South West, Nigeria. The respondents were selected using a multistage sampling technique. During the first phase, four states - Osun, Ogun, Kwara, and Lagos - were selected using purposive selection approach, taking into account the presence of two public Colleges of Education in a state. In the second stage, three tertiary institutions were selected from each state using a stratified random sampling technique. The selection process took into account the presence of Basic Science Education as a course in both universities and colleges of education. This resulted in a total of twelve higher institutions being selected, consisting of one university and two colleges of education from each state. During stage three, a total of twenty students were selected from each University, while 159 students were picked from each College of Education using the stratified selection approach. A total of 1,352 participants were selected from Universities and Colleges of Education, with 80 students picked from one group and 1,272 students chosen from the other group. However, only 1,350 questionnaires were successfully collected after the instrument was administered, resulting in a final sample size of 1,350. The research used a self- designed questionnaire called "Questionnaire on Sociological Factors as Predictors of Drug Abuse among Basic Science Education Students (QSFPDABSES)" to gather pertinent information from the participants. The instrument has three distinct portions, specifically: portions A, B, and C. Section A of the instrument requests complete bio-data from the respondents, including the name of their institution. Section B comprises 15 items that gathered data on the prevalence of drug abuse among Basic Science Education Students. Section C comprises 15 items that explore the sociological factors, such as peer group, residential location, and parenting style that may predict drug abuse among Basic Science Education Students. The tool is constructed on a Likert-type scale with the following options: The tool utilizes a modified Likert type scale for section B, with response options including Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The questionnaire is assessed by assigning points in the following manner due to the fact that the questions were phrased in a negative direction: Strongly Agree (SA) is assigned a value of -1 point, Agree (A) is assigned a value of -2 points, Disagree (D) is assigned a value of 3 points, and Strongly Disagree (SD) is assigned a value of 4 points. The used validity methodologies were face and content validities. The professionals that were consulted for the included experts in the domains of Tests and Measurement, Guidance and Counselling, and Basic Science Education from the Faculty of

Education. Test-retest approach was used to establish the reliability of QSFPDABSES by giving it twice, with a two-week interval, to a sample of 20 Basic Science Education students in the Science Education department of the Faculty of Education at Ekiti State University, Ado-Ekiti. The scores received from the two tests were analyzed using the Pearson"s Product Moment Correlation analysis. The analysis resulted in a reliability coefficient of 0.89, indicating that the instrument utilized may be considered trustworthy. The data gathered were analyzed using descriptive and inferential statistics. The research question was answered using frequency count, mean, and bar chart. Hypotheses one and two were tested using t- test analysis, whereas hypothesis three was tested using simple linear regression analysis. The three hypotheses were tested at 0.05 level of significance.

Results

Research Question

What is the prevalence of drug abuse among Basic Science Education students in tertiary institutions?

The scores pertaining to drug misuse among Basic Science Education students at tertiary institutions in South west, Nigeria were calculated in response to the i tems in the questionnaire. The replies to the questions were shown using frequency counts and percentages. The prevalence of drug misuse among students at tertiary institutions in South West, Nigeria (low, moderate, and high) was determined using the percentile distribution method. Participants who had a score of 33.3 percent (33.3) or lower on the assessment of drug abuse among students in tertiary institutions and below were classified as having a 'low' prevalence of drug abuse. Conversely, those who obtained a score of 66.6 percent (66.6) or above were classified as having a 'high' prevalence of drug abuse. The scores of the groups with lower and higher prevalence were classified as having a "moderate" level of drug misuse. The prevalence of drug abuse is categorized as follows: a low prevalence ranges from 48.95 to 49.00, a moderate prevalence ranges from 49.01 to 97.89, and a high degree of drug abuse is from 97.90 to 147.0. The frequency of drug usage among Basic Science Education students in tertiary institutions in South west Nigeria is quantified and shown in Table 1 below.

Table 1: Prevalence of Drug Abuse among Basic Science Education Students in Tertiary Institutions in South West, Nigeria

Prevalence of drug abuse	Frequency	Percentage
Low (48.00-49.00)	81	6.0
Moderate(49.01-97.89)	1260	93.3
High(97.90-147.00)	9	0.7
Total	1350	100.0

The result in Table 1 shows that out of 1,350 students sampled, 81, representing 6 percent indicated low prevalence of drug abuse. Those who indicated moderate prevalence were 1,260 representing 93.3 percent while those who reported high prevalence of drug abuse were 9 representing 0.7 percent. This shows that the extent of prevalence of drug abuse among Basic Science education students in tertiary institutions in South west, Nigeria was moderate. The prevalence of drug abuse among Basic Science education students in tertiary institutions in South west, Nigeria was moderate and this is further depicted in Figure 1.

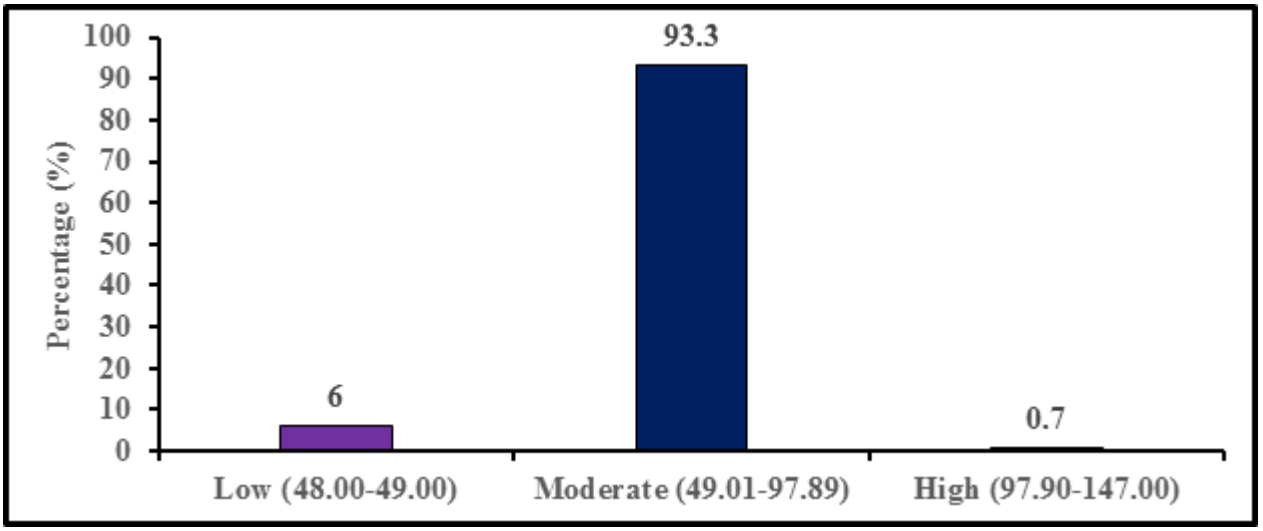

Figure 1: Bar Chart showing the prevalence of drug abuse among Basic Science education students in tertiary institutions in South west, Nigeria.

Testing of Hypotheses

Hypotheses 1

Drug abuse among Basic Science Education students in tertiary institutions will not be significantly influenced by their residential location.

To test the hypothesis, the average scores on drug misuse among students studying Basic Science at tertiary institutions located in both rural and urban regions was calculated and compared. T-test at a significance threshold of 0.05 was used to determine whether the differences were statistically significant. The result is presented below.

Table 2: t-test showing drug abuse among undergraduates by location

Group	N	Mean	SD	df	t	P
Rural	945	73.08	11.79			
				1348	2.535*	.011
Urban	405	71.43	8.80			

***p>0.05**

According to Table 2, the calculated t-value (2.535) was found to be significant at the 0.05 level for the groups, as shown by a p-value of less than 0.05. The null hypothesis was not accepted. This suggests that the living location of students will have a substantial impact on their drug usage behavior.

Hypotheses 2

There is no significant difference in the level of drug abuse among Basic Science education students in tertiary institutions. Based on parenting style.

In order to test the hypothesis, mean scores on drug abuse among Basic Science education students in tertiary institutions based on parenting style were computed and compared for statistical significance using t-test statistics at 0.05 level of significance. The result is presented below.

Table 3: t-test Showing Drug Abuse among Basic Science Education Students in Tertiary Institutions by Parenting Style

Group	N	Mean	SD	df	t	P
Authoritative	9	71.00	1.50			
				1348	0.434	.664
Permissive	1341	72.60	11.04			

Table 3 indicates that the calculated t-value (0.434) with a p-value greater than 0.05 did not reach statistical significance at the 0.05 level for the groups. The null hypothesis was not disproven. This indicates that there is no significant difference in the prevalence of drug usage and parenting style among Basic Science education students at tertiary institutions.

Hypotheses 3

Peer group will not significantly influence the level of drug abuse among Basic Science Education students in tertiary institutions in South west, Nigeria**.**

In order to test the hypothesis, scores relating to peer group and level of drug abuse among Basic Science education students in tertiary institutions were computed and subjected to statistical analysis involving Simple Linear Regression statistics at 0.05 level of significance. The result is presented in Table 4.

Table 4: Simple Linear Regression Analysis of Peer Group and Level of Drug Abuse among Basic Science Education Students in Tertiary Institutions

	Unstandardised Coefficients		**Standardized Coefficients**		
Model	**B**	**Std. Error**	**Beta (β)**	**t**	**Sig.**
(Constant)	94.980	2.294		41.398	.000
Peer group	-1.277	.130	-.259	-9.839	.000
$R=0.259$, $R^2= 0.067$, Adjusted $R^2=0.066$, $F_{1,1348}=96.805$					

Table 4 demonstrates a substantial impact of peer group on the extent of drug usage among Basic Science education students at tertiary institutions ($F_{1,1348} =96.805^*$, $p<0.05$). The null hypothesis has been disproven. The table indicates a statistically significant, although weak, positive correlation ($R=0.259$, $p<0.05$) between the predictor variable (peer group) and the level of drug usage among Basic Science education students at tertiary institutions. This suggests that the predictor variable has the potential to significantly impact drug usage among Basic Science education students at postsecondary institutions. The coefficient of determination reveals that the predictor variable explains 6.7% of the total variance in drug abuse among Basic Science education students in tertiary institutions. The remaining 93.3% of unexplained variation is primarily attributed to other variables that contribute to drug abuse among Basic Science education tertiary institutions' students. The computed F-ratio (96.805) was statistically significant at a significance level of 0.05.

Discussion

The research revealed that the occurrence of drug misuse among Basic Science education students at tertiary institutions in South west, Nigeria, was of a moderate level. The statement suggests that it is beneficial for students studying Basic Science Education at tertiary institutions to engage in excessive and chronic self-administration of a drug or to rely heavily on and abuse a specific substance without obtaining a medical diagnostic from competent health professionals. The reason for this result might be attributed to the joint efforts of the government and other education partners in raising awareness about the adverse effects of illegal drug usage among tertiary institution students. This finding is in contrary to Odejide's (2014) findings who claimed that the widespread of cannabis use followed by psychotropic substances (specifically benzodiazepines and amphetamine-type stimulants), as well as heroin, cocaine, and volatile organic solvents, particularly among young people in urban and rural areas, this finding refutes such assertions.

Furthermore, it was shown that the prevalence of drug usage among students studying Basic Science education was highly impacted by their place of residence. By inference, the location of students has a role in drug usage. The observed correlation might be attributed to the detrimental impact of residential location on students' drug addiction. The discovery aligns with the assertion made by Ogbemuda and Aiasa (2015) that the physical and psychological circumstances of the residential area have an impact on students' drug addiction. The study also indicated that there was no statistically significant variation in the prevalence of drug addiction among Basic Science Education students at higher institutions depending on parenting style. It suggests that the parenting style has an impact on the extent of drug usage among students in higher education institutions. This discovery arose from the manner in which parents implement effective disciplinary and monitoring strategies, which significantly influence adolescents' engagement in drug misuse. The discovery corroborates Agwogie's (2017) study, which suggests that parenting style is a strong indication of parenting effectiveness and may predict a child's well-being in various situations and among different groups of children. The study emphasized that families characterized by a high prevalence of marital conflict, divorce, alcohol and drug abuse, poverty, or stressful life events are more likely to impact children, leading to a greater occurrence of emotional issues and psychiatric abnormalities. The research also shown that the peer group had a substantial impact on the prevalence of drug usage among students studying Basic Science education at tertiary institutions. The statement suggests that the peer group has a significant impact on the prevalence of drug usage among

students at postsecondary institutions. This may be due to the fact that peer groups provide social support, provide ongoing feedback on interpersonal dynamics, and create a feeling of security as they collectively strive for independence from parents. The discovery corroborates the research conducted by Oniya et al (2022) supports the notion that peer groups have a role in providing relaxation, amusement, pleasure, and reinforcement for students studying Basic Science Education.

Conclusion

The findings of the study showed that the frequency of drug usage among Basic Science Education students in tertiary institutions in South west, Nigeria was moderate. Peer group and residence location were significant sociological variables that affected drug usage among Basic Science Education students at tertiary institutions in South west, Nigeria. Nevertheless, the incidence of drug addiction among students pursuing Basic Science Education at higher institutions remained consistent regardless of the manner of parenting.

Recommendations

Based on the findings of the study, the following recommendations are made;

1. Educational stakeholders should make a joint and determined effort to eliminate the increasing occurrence of drug addiction among students in higher institutions.
2. Educationstakeholders, including government, NGOs, philanthropists, Basic Science Education lecturers, School administrators, and parents, should prioritize social factors linked to drug abuse, such as peer group pressure and family-related factors, in order to decrease the occurrence of drug abuse among undergraduate students in tertiary institutions.
3. Tertiary institution counselors should implement programs aimed at raising awareness about drug addiction among undergraduate students. A thorough comprehension of the notion of drug awareness will enable students to make well-informed judgments and provide support when needed. A comprehensive and efficient counseling treatment should be developed to detect, evaluate, and address the emotional distress caused by the loss of a loved one among college students, with the aim of preventing the recurrence of drug dependency.
4. Parents' modeling behavior may have a beneficial influence on children's drug use and abuse, perhaps deterring them from engaging in such behavior.
5. Parents should get education on the risk factors associated with child abuse in order to effectively

identify children who are engaged in drug abuse or who may be susceptible to drug addiction. This will help them make informed judgments in order to detect and prevent drug addiction among students in higher institutions.

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Animated- Cartoons Aided Instructional Package and Pupils' Achievement in Mathematics in Ekiti State Primary Schools

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Abstract

The study investigated animated- cartoons aided instructional package and pupils' achievement in Mathematics in Ekiti State primary schools. The study adopted pre-test, post-test, control group quasi- experimental design. The sample for the study consisted 74 Primary two pupils who were chosen through multistage sampling procedure. The instrument for the study was Mathematics Achievement Test (MAT). Their scores were analyzed using Pearson's Product Moment Correlation Analysis which yielded reliability coefficient of 0.85. The data collected were analyzed using descriptive and inferential statistics. The findings of the study showed that the use of animated- cartoons aided instructional package was effective in teaching Mathematics in primary schools. It further revealed that retention level of pupils taught Mathematics using animated-cartoons aided instructional package was high in primary schools. The finding also showed that there is no significant difference in the mean scores of pupils exposed to animated-cartoons aided instructional package in primary schools Mathematics on the basis of school location. Based on the findings, it was recommended that teachers should be trained on how to use animated-cartoons aided instructional package to improve pupils' retention in Mathematics in primary schools.

Keywords*: Achievement, Animation, Cartoon, Instructional Package, Technology*

Introduction

Mathematics helps pupils to recognize the difference that exist between two or more numbers. It is a subject that is relevant to all other subjects taught in schools today, as it is a lead way for pupils planning to gain admission into secondary and higher institution of learning. The survival of technology, weather forecasting, banking, data processing, accounting, and medical among other fields depends on a solid

understanding of Mathematics. Mathematics is used to put the right peg into the right hole by providing qualitative and quantitative techniques for planning and decision- making skills for every human to live a better life. (Oginni & Owolabi 2014). Everyone needs Mathematics in their daily lives no matter the nature of their occupation. Mathematics teaches people to be systematic or methodical because it involves the application of knowledge. There are countless Mathematical patterns in the fabric of nature, and it develops certain skills such as the ability to reason, creative, or think abstractly.

Mathematics is a subject that requires logical reasoning and practice with numerical problems to help pupils learn concepts. Pupils must practice the problems repeatedly to fully grasp them and think effectively (Pearse& Walton, 2011). Mathematics serves as the foundational intellectual discipline of the modern society and the language of science, whose emphasis on scientific literacy has become a prerequisite for any country' s technological advancement (Federal Ministry of Education, 2014). Mathematical applications and development of contemporary society have garnered a greater public interest in our modern age of science and technology thereby giving it a more prominent position. It is crucial to the advancement of information and communication technology (ICT). Mathematics is more than just the science of numbers, which involves in knowledgetransmission and understanding of strange phenomena and it links them to other civilizations in order to advance the educational system.

According to Odeyemi (2022), the problems faced by Mathematics educators and pupils worldwide are summed up as follows: lack of teaching techniques, inadequate trained Mathematics instructors, teachers with degrees from other fields teaching Mathematics, a lack of understanding between the pupils and the subject, inadequate materials, inadequate classrooms, lack of confidence, fear and doubt, a low intelligent quotient, a short attention span, and a lack of understanding of signs and symbols, Some qualified Mathematics educators have administrative duties which prevent them from fulfilling their primary responsibility of teaching.

Poor methods of teaching seem to be one of the main causes of pupils' abysmal academic achievement in Mathematics. Instead of involving pupils in active learning, the approach to teaching Mathematics emphasizes memorization procedures and the distribution of rules. The inability to apply their Mathematical knowledge to solve problems on a daily basis result from lack of appropriate critical thinking habits. In a traditional classroom, the teacher is the sole source

of instruction, and the pupils are solely restricted to listening. It is really challenging when pupils are not allowed to participate enough in regular classroom settings. Pupils spend a lot of time sketching and reading, thus there are typically little chances for individualized attention or response. This approach to education has not succeeded in fostering true Mathematical knowledge and does not encourage independent study and pupil's engagement. In order to solve a specific problem, pupils can use Mathematics to study and grasp Mathematical concepts (Samuelson, 2011).

Pupils must be familiar with the teaching strategies that works best for each pupil. Therefore, teachers should concentrate on pedagogical strategies that could increase pupils' interest in Mathematics. This method of teaching could be viewed as the vehicle through which a message is delivered. Alieme and Monica (2015) acknowledged that it is important for Mathematics teachers to adopt different methods of teaching pupils. To impact knowledge, good teaching requires teachers to employ a variety of approaches and learning processes. In this study, the researcher intends to see how abstract Mathematics teaching could be concretized.

Animated-cartoons aided instructional package is an educational technique which could be utilized to ease test anxiety, lower tension, improve the learning atmosphere, guarantee attention continuity, and attract pupils' attention. Cartoon and animated images are the same. The term "anima" in Yunani originates from the word for life and soul. It may also refer to giving an object life by stirring it at a precise time. Today, animated-cartoons have been a part of man's life since childhood. According to Baykul (2001) using animated-cartoons to teach Mathematics should include all of the educational levels. Developing of high-level skills in Mathematics is a useful activity and with the implementation of animated- cartoon in teaching Mathematics. Most of the animated cartoons are specially made to help pupils' achievement in Mathematics. These animated cartoons develop the pupils, add values of responsibility, fairness, trust, sharing, among other things which help them facilitate the learning of music and gymnastic moves and contribute to the teaching of concepts and development of other cognitive skills. Animated-cartoons are the strategies that can be used to support Mathematics teaching in class or outside the class. Animated-cartoons support teaching in constructive learning, contextual learning, social skills, collaborative learning and critical thinking (Ilhan &Certinkaya, 2013).

The use of animated-cartoons in teaching Mathematics in class also prevents pupils' destructive behaviours, ease boredom and increase the amount

of interest and connection, thereby helping to build a positive learning location. Using animated cartoons in teaching Mathematics is a better medium of communication and therefore, it deserves to be studied. The language used is simple for learners or pupils to understand and it is useful for eliminating the contradictions between perception and reality because phenomena and events are generally exaggerated to succeed in explaining action. Using animated-cartoons in teaching Mathematics in class encourages pupils to think seriously, attracts attention and decreases monotonousness of the subject. Through this, the teaching period can be made likeable, and therefore, the will to learn can be increased. It also increases the memorability of Mathematics and provides effective learning through colour and sounds.

A cartoon is a common tool with many vibrant colors that is primarily used for enjoyment. A cartoon can also be a little animated film, movie, or video. Science concepts are visually represented through concept cartoons. The straightforward illustrations present a variety of perspectives on scientific concepts in contexts that are intended to interest and inspire pupils and promote debate of the concepts. Pupils are the primary audience for cartoons. They are typically broadcast on television or published in newspapers and magazines. Cartoons were previously meant for the purpose of entertainment only but these days, cartoons are now being extensively used for other purposes as well. Cartoons are now being used for education and spreading of awareness amongst the people in addition to being a form of entertainment. Teaching is a very strenuous profession. Transferring one's knowledge from one's mind into another pupils' mind requires a lot of effort. This makes teaching more difficult and needs a lot of new tools, concepts, and tactics. The effectiveness of animated cartoons could be a source of real audiovisual materials for teaching arithmetic in schools.

In order to motivate pupils' interest in Mathematics during the teaching and learning process, application of animated cartoons bring about a positive difference when used as a trustworthy and reliable source of instruction. A growing number of educators are using animated cartoons as a teaching tool to replace the conventional approach to teaching Mathematics. Cartoons help pupils learn more effectively and more efficiently because they breathe life into dry book pages and reveal obscure concepts. Cartoons draw a lot of attention. The cartoon visuals that children view leave an effect on their minds, and they often remember what they saw in cartoons or what actions the cartoons performed.

Animation is a method for transforming static images into moving ones. In a conventional animation, pictures are manually painted or sketched on cellulose sheets before being

photographed and shown on films. The majority of animation created today uses computer-generated imagery (CGI). Animated educational movies encouragepupilsto explore complicated facets of knowledge while also fostering their comprehension and creativity. Pupils' skill sets are improved through animated cartoons. As a result, this makes it possible for teachers to illustrate various concepts. Additionally, it is a playful approach to learning that encourages experimentation.

Animation refers to techniques of photographing successive drawing or positions of models. Animation describes the techniques used to photograph subsequent sketches or locations of models in order to replicate a moment when a film is shown in a sequence. A cartoon is a sketch, a television programme, or a film that employs animation techniques. Since there is no formal distinction between them and they frequently have subtle variations of the same thing, any technique that mimics the motion of the screen is regarded as animation.

Animated-cartoons as an attention - gaining strategy help to reduce the processing demands in science, technology and Mathematics (STM). In Mathematics, 'Aktas, Bulut and Yuksel (2011)reportthat academic performance of the pupils increased by using computer animation and activities about patterns. Instructors' creative approaches to the teaching of Mathematics could be influenced by the use of effective strategies at all educational levels in terms of impacting knowledge and skills to the pupils. To help one understand is therefore considered a modus operandi for effective problem solving. It is a method for solving problems where an expression is present, such as when trying to simplify an algebraic equation. According to Breen and O'Shea (2010), Mathematics thinking involves thinking, reasoning, abstraction, and specialisation, all of which help pupils progress.

Animated-cartoons makes it possible to include more complex visual demonstrations into the classroom in order to teach and clarify technical and abstract concepts and to provide pupils with a better option. Cartoons, which are described as humorous drawings, are most frequently found in newspapers as a form of social commitment. When a teacher uses humor and is able to make the pupils smile or laugh, then the teacher, at least, in part knows that the pupils have been engaged with their response, which is one form of feedback to the teacher. It is essential to have a strong library of appropriate animated cartoons, which can be accumulated over time. Once they are aware of the package, pupils frequently lend a hand by finding the right examples—or a number of them. According to the study, using animated cartoons as a teaching technique can make Mathematics

lessons more engaging and help pupils develop critical thinking skills.

The study examined the animated-cartoons aided instructional package andpupils' achievement in Mathematics in Ekiti State primary schools.

Purpose of the Study

i. To examine the effects of animated-cartoons aided instructional package and pupils' achievement in Mathematics;
ii. To determine whether the use of animated-cartoons aided instructional package influence pupils' retention in Mathematics.
iii. To determine if there is a significant difference in the pre-test and posttest means scores of pupils in the experimental and control group.
iv. To determine whether there is a significant difference in the performance mean scores of male and female pupils exposed to animated-cartoon aided instructional package

Research Questions

The following research questions were raised to guide the study:

1. What is the performance of pupils exposed to animated-cartoons aided instructional package and those in control group in Mathematics?
2. What is the retention of pupils exposed to animated-cartoons aided instructional package in Mathematics?

Research Hypotheses

The following null hypotheses were formulated to guide this study:

1. There is no significant difference in the pre-test means scores of pupils in the experimental and control group.
2. There is no significant difference in the post-test means scores of pupils in the experimental and control group.
3. There is no significant difference in the performance mean scores of male and female pupils exposed to animated-cartoon aided instructional package

Materials and Methods

This study adopted pre-test, post-test, control group quasi-experimental design (one experimental group and one control group). The population for the study consisted of 18,215 Primary Two pupils in public schools in Ekiti State (State Universal Basic Education Board 2023). The sample for this study comprised of 74 primary two pupils selected from four public primary schools using multi stage sampling procedure. The instrument for this study was Mathematics Achievement Test (MAT). The instrument was subjected to validation by experts in the Department of Science Education and experienced Mathematics teachers for face and content validity. The reliability of the instrument was done by using test- re-test method. The instrument was administered twice on 20 primary two pupils in the public primary schools

outside the sampled schools for the study for two weeks. Their scores were correlated by using Pearson's Product Moment Correlation Analysis which yielded reliability coefficient of 0.85, which was adjudged high enough to consider the instrument reliable. The experimental procedure for this study was in three stages, namely: the pre-treatment stage, treatment stage and post-treatment stage. The data generated from the instrument were analyzed using descriptive and inferential statistics. The research questions raised were answered using mean and standard deviation while the hypotheses formulated were tested using t-test. All the hypotheses were tested at 0.05 level of significance.

Results and Discussions

***Research Question* 1**: What is the performance of pupils exposed to animated-cartoon aided instructional package and those in control group in Mathematics?

To answer this research question, mean scores and mean difference were calculated. The result is presented in Table 1.

Table 1: ***Mean and Standard Deviation of Pupils Performance in Experimental and Control Groups***

Source of Variation		**N**	**Mean**	**SD**	**Mean Difference**
Animated Cartoon	Pre-test	36	7.86	2.63	17.50
	Post-test	36	25.36	2.72	
Control	Pre-test	38	8.79	1.10	2.053
	Post-test	38	10.842	1.149	

Table 1 showed the difference between the pre-test and post-test performance of pupils in experimental (animated cartoon) and control groups in Mathematics. The results revealed that the pre-test mean scores of pupils in experimental group is 7.861 and the post-test mean scores is 25.361. The mean difference of 17.5 was obtained in favour of post-test. The mean scores of the pupils in control group in pre-test is 8.789 while that of post-test is 10.842. The difference of 2.053 was obtained in favour of post-test. The post-test mean scores of pupils in experimental group was higher than that of control ground. The results indicated that the mean difference for the animated cartoon is 17.50 while that of the control group is 2.053. Therefore, performance in Mathematics of pupils exposed to animated cartoon is better than those in the control group.

***Research Question* 2**: What is the retention level of pupils exposed to animated-cartoons aided instructional package in Mathematics? To answer this research question, mean scores of the performance in post-test scores and retention scores of pupils exposed to animated cartoon instructional package are calculated and the results were presented in Table 2:

Table 2: Mean and Standard Deviation of Pupils' Retention Level in Animated Cartoons group.

Retention of Pupils in Experimental Group	N	Mean	SD	Mean Difference
Post-test scores	36	25.36	2.72	1.03
Retention scores	36	26.39	2.97	

The results in Table 2 showed the retention level of pupils exposed to animated cartoons instructional package. The mean scores of the post-test is 25.361 while the mean scores of the retention score is 26.389 with mean difference of 1.028. The results indicate that the retention level of the pupils in Mathematics was higher than that of pre-test which implies that the use of animated cartoons instructional package is effective in achieving pupils' retention in Mathematics.

Testing of Hypotheses

Hypothesis 1: There is no significant difference in the pre-test mean scores of pupils in the experimental and control group.

Table 3: *t-test Analysis of Pre-test Mean Scores of Pupils in Experimental and Control Groups*

Sources of Variations	N	Mean	SD	df	t_{cal}	P-value
experimental	**36**	**7.861**	**2.63**	**72**	**1.391**	**0.169**
control	**38**	**8.789**	**3.10**			

P>0.05

Table 3 showed that the t = 1.391, P >0.05. This implied that null hypothesis was not rejected. Hence, there was no significant difference in the pre-test mean scores of pupils in the experimental and control group. This implied that pupils in both groups were homogenous before the treatment. Therefore, any change that occurs thereafter could be as a result of the treatment given.

Hypothesis 2: There is no significant difference in the post-test mean scores of pupils in the experimental and control group.

Table 4: *t-test Analysis of post-test Mean Scores of Pupils in Experimental and Control Groups*

Sources of Variations	N	Mean	SD	df	t_{cal}	P-value
experimental	**36**	**25.361**	**2.789**	**72**	**21.018**	**0.000**
control	**38**	**10.842**	**3.149**			

P<0.05

Table 4 showed that the t = 21.018, P < 0.05. This implied that null hypothesis was rejected. Hence, there was significant difference in the post-test mean scores of pupils in the experimental and control groups. The mean scores showed a significant difference of 14.519 in favour of pupils in experimental group and this implies that animated-cartoons aided instructional package was effective for teaching of Mathematics in primary schools.

Hypothesis 3: There is no significant difference in the performance mean scores of male and female pupils exposed to animated-cartoon aided instructional package.

Table 5: *t-test Summary of Male and Female Pupils Exposed to Animated-cartoons Aided Instructional Package*

Sources of Variations	N	Mean	SD	df	t_{cal}	P-value
Male	16	26.333	2.609	34	1.820	0.078
Female	20	24.650	2.833			

P>0.05

Table 5 showed that the t = 1.820, P > 0.05. This implies that the null hypothesis was not rejected. Hence, there was no significant difference in the mean scores of male and female pupils exposed to animated-cartoons aided instructional package in Mathematics in primary schools. This implies that the treatment had the same effect on both male and female pupils in Mathematics in primary schools.

Discussions

The finding of the study revealed that the use of animated-cartoons aided instructional package was effective for teaching Mathematics in primary schools. This agreed with the work of Munir (2016) that the use of cartoons in science instruction has allowed for the successful evocation of prior information, conceptual growth, and multiple methods of learning scientific concepts. It is crystally clear from this finding that animation can explain complex Mathematics concept in a simple and entertaining manner. The finding also supported the work of Bada (2012) that animated-cartoon films enable pupils to function at a higher level and provide more information that could bring about Mathematics enjoyment. The finding of this study showed that there is significant difference in the post-test mean scores of pupils in the experimental and control groups. This implies that animated-cartoon aided instructional package was effective for teaching of Mathematics in primary schools. The finding is in agreement with the work of Aktas, Bulut and Yuksel (2011) that academic performance of the pupils increased by using computer animation and activity patterns. The finding opposed the work of Munir (2016) that television is rarely the only source of social learning. Using animated cartoon can make visual aid not only simpler but also less cluttered, vivid, engaging and more intuitively comprehended.

The finding equally revealed that the treatment had the same effect on both male and female

pupils in Mathematics in primary schools. The finding contradicted the work of Maikanno (2007) that gender of pupils was one aspect that affected their comprehension in Mathematics. The finding disagreed with the works of Oginni & Owolabi (2014), Wijethilaka (2020) that girls often score worse than boys on average, although secondary school Mathematics performance in Nigeria has recently been generally dismal. The finding implied that other factors aside gender could influence pupils' performance in Mathematics in primary schools. Animated cartoons have both positive and negative effects on gender depending on what they are interested in watching. The study concluded that animated-cartoons aided instructional package was effective for teaching Mathematics in primary schools. The use of animated-cartoons aided instructional package brought significant improvement to both performance and retention of primary schools in Mathematics.

Conclusion

The study concluded that animated-cartoons aided instructional package was effective for teaching Mathematics in primary schools. The use of animated-cartoons aided instructional package brought significant improvement to both performance and retention of primary schools in Mathematics. The package is gender insensitive and is potent at all location.

Recommendations

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

1. Primary school teachers should be trained on how to effectively use animated-cartoons aided instructional package to improve pupils' performance and retention in Mathematics.
2. Animated-cartoons aided instructional package should be used to teach all categories of pupils irrespective of their gender differences so as to improve their performance in Mathematics.
3. Parents should provide animated cartoons instructional package for their children at home to improve their retention.
4. Pupils should be allowed to use animated-cartoons aided instructional package to achieve positive performance in Mathematics.
5. Government should provide gadgets on animated cartoons aided instructional package to teach the pupils in the classroom.

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ARTIFICIAL INTELLIGENCE ASSISTED INSTRUCTIONAL STRATEGY AND STUDENTS' ATTITUDE TOWARDS LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN OYO STATE

By

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Abstract

This study examined the impact of AI assisted Instructional strategy on students' attitude towards learning of Biology in senior secondary schools in Oyo State. Quasi-experimental design with 2x2x1 factorial matrix was used. 90 students from two intact classes in two Senior Secondary Schools selected by multistage sampling techniques participated in it. Four hypotheses were tested at 0.05 level of significant. The instruments used for the study were Students' Attitude towards Biology questionnaire (SABQ) and Students' Mental Ability Test (SMAT) and AI assisted Instructional Package in Biology (AIAIPB). The reliability of SABQ was done with Cronbach's alpha with the value of 0.84 obtained while value of 0.78 was obtained for SMAT using KR20. Data were analyzed using ANOVA and ANCOVA. The result of the finding showed significant difference between the pre-test and post-test mean score of students' attitude in experimental and control groups ($F(2,187) = 11.039$, $p < .05$, $n^2 = .106$) with effect size of 10.6%. Based on the research findings, the teacher training curriculum at all levels of education should incorporate the use of AI in teaching to foster positive attitude among the students.

Keywords: Artificial intelligence, Attitude, Biology, Gender

Introduction

Generally, in order to enhance educational achievements in a scalable and affordable manner, educators have been adopting contemporary technologies and methods over the years. The planning and execution of education have been impacted by contemporary educational technology, such as learning management systems, gamification, and virtual reality (Mhlanga 2023 with Qadir 2023). Digital tools are widely acknowledged to hold the ability to address numerous current educational difficulties, reinvent teaching and learning, and make learning process easier worldwide (Adiguzel, Kaya, & Cansu, 2023 with Jeyarani 2023).

AI can be used to evaluate students' performance and do not only gives teachers the ability to quantify and grade students work but also makes it possible to provide each student with tailored guidance to help them overcome academic performance gaps (Dhara, Chatterjee, Chaudhuri, Goswami, & Ghosh, 2022). AI may also help with distant learning, allowing students to participate in the process whenever and wherever they choose—from their homes, Internet cafés, offices, etc. With the aid of AI tools, instruction may be customized and adjusted to the speed at which students' comprehension grows (Sevara, 2023).

AI can also help to enhance positive attitude of students towards Biology and invariably improve students' academic performance. A key component of the teaching and learning process is attitude, which is also intimately linked to performance in science. A positive disposition may enhance better performance in science. Students' attitudes and scientific knowledge can be influenced by their attitude to use of AI Assisted instruction programming (Ogunleye, 2023). According to Adesoji (2008), there are a number of variables that can affect learners' attitudes towards science, including the school environment, parental participation, parents' educational backgrounds, and instructional strategies.

One of the strategies that can influence students' attitude is computer simulation. Computer simulation is an AI Assisted instructional strategy which depicts the actual occurrences or phenomena that enable users to comprehend the reasoning behind parameter modifications (Okwuduba, Offiah & Madichie 2018). It is described as a computer program that includes a manipulable representation of an actual theoretical system. It's a method of instruction that makes some of the things that happen in the classroom real. Additionally, it piques students' curiosity by providing them with knowledge during the educational process that they could not otherwise obtain in a typical classroom context. When AI assisted instructional strategy

is used in the classroom, abstract concepts become real and learning becomes hands-on. It encourages group learning among students and supports their growth in independent study. In addition, it offers a way for students to connect with one another instead of using the traditional teacher-student method. Additionally, by employing a model of the scenario, AI assisted instructional strategy can be used to help visualize the outcomes of a real-life scenario (Sreelekha 2018).

Another factor that study has shown to influence students' attitude is mental ability. Mental ability is the capability of students to demonstrate certain knowledge depending on the nature of the situation in which the individual first has chance to construct the items of knowledge and the requirements of the learning material. In other words, mental ability is the level of intellect or cognitive development of students to cope with the learning in the classroom. According to Ogunleye (2019), most students find it difficult to apply knowledge in class due to lack of appropriate mental level of comprehension and application and this may affect their attitude towards learning. Olagunju and Chukwuka (2008) discovered that there is a substantial association between students' attitude and performance in an intelligence test in terms of specific mental capacities. There is a lot of emphasis on formal reasoning in the classroom, which is focused on abstraction and does not take into account real-world context. This absence of formal operational reasoning in students may influence student attitude (Sangodoyin, 2011). It is against this background that this study investigates the impact of AI assisted instructional strategy on students' attitude towards Biology.

Purpose of the Study

The purpose of this study is to examine the impacts of AI Assisted instructional strategy students' attitude towards learning of Biology in Oyo State, Nigeria. The study specifically examined

i. the difference in the attitude of students exposed to AI Assisted instructional strategy before and after treatment;
ii. the effects of gender on attitude of students exposed to AI Assisted instructional strategy and conventional teaching;
iii. the effects of Mental ability on attitude of students exposed to AI Assisted instructional strategy and conventional teaching;

Research Hypotheses

The following null hypotheses were generated for this study:

1. There is no significant difference in the pre-test mean score of students' attitudes exposed to AI Assisted instructional strategy and conventional teaching strategies in Biology.
2. There is no significant difference between the pre-test and post-test

mean score of students' attitudes exposed to AI Assisted instructional strategy and conventional teaching strategies in Biology

3. There is no significant effects of gender on students' attitude exposed to AI Assisted instructional strategy and conventional teaching strategies in Biology
4. There is no significant moderating effect of Mental Ability on student's attitude exposed AI Assisted instructional strategy and conventional teaching strategies in Biology.

Materials and Method

The study adopted a pre-test, post-test, quasi-experimental design using a 2X2X1 factorial matrix. All Senior Secondary Two (SS 2) Biology students in all secondary schools in Oyo State, Nigeria, make up the study's population. The selection of SS 2 students was based on the fact they have been exposed to some basic biological concepts in SS 1. The sample was made up of 90 biology students from two intact classes in two secondary schools in Oyo State, Nigeria. To choose the sample, a multistage sampling procedure was employed. The Students' Attitude towards Biology Questionnaire (SABQ) and the Students' Mental Ability Test (SMAT) were the two instruments utilized to collect data.

The researcher developed the Students Attitude to Biology Questionnaire (SABQ) to gauge students' attitudes towards biology when biology is taught with AI-assisted instruction. There are two parts to the instrument. Students' personal information, including their name and sex, is contained in Section A. Section B consists of 20 Likert-type scale responses ranging from Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The scoring of SAQB is as follows: For positive questions Strongly Agree (SA) = 4 marks, Agree (A) =3 marks, Disagree (DA) =2 marks, Strongly Disagree (SD) – 1 mark. While for negative questions Strongly Disagree (SD) = 4 marks, Disagree (DA) = 3 marks, Agree (A) = 2 marks, Strongly Agree (SA) – 1mark.

The Australian Council for Educational Research's (ACER) standardized Mental Ability Test (a multiple-choice, four-point exam) was adopted for the Students' Mental Ability Test (SMAT). There are thirty items on the SMAT. The test results were utilized to classify students to mental ability level. A student can receive a maximum score of 30. Students scoring 21 or more will be classified as having a high mental level; those scoring 12 to 20 will be classified as having a medium mental level; and those scoring less than 12 were classified as having low mental ability level. Educational technologist, biology educator, and experts in tests and measurement carried out the face and content validity of the instruments.

These experts assisted in evaluating the coverage and wording of the test and attitude scale items. Their feedback and recommendations were taken into consideration when altering the content. Experts stated that the items and instrument construction have facial relevance and acceptability to what the instrument claims to measure in terms of face and content validity. The reliability of the instruments were determined using Cronbach's alpha for SAQB in which the value of 0.84 was obtained and Kuder Richardson (KR20) was used for SMAT in which reliability coefficient values 0.78 was obtained. The study lasted ten weeks and was conducted in three phases: In the first stage, the researcher went to see the administrators of the schools to get their approval. The teachers from the chosen schools who acted as research assistants received training on the usage and implementation of AI-assisted educational strategies. Following this, they will utilize the strategy to evaluate its proficiency.

The control group's teachers will also become acquainted with the study's objectives and procedure. Every one of them will receive the objectives and content of every topic. To determine the homogeneity of the groups, the researcher administered to the students a pretest about their attitudes towards learning of biology to both the experimental and control groups. Additionally, a mental ability test was given to the pupils in order to assign them to various mental ability groups.

Stage II, on the other hand, lasted eight weeks and involved the research assistant administering the treatment to both groups while making sure that operational guidelines were followed. The final stage of the experiment, known as Stage III, involved giving the students SAQB to see how the treatment affected them.

Data Analysis

Hypotheses were tested using analysis of Variance (ANOVA) and Analysis of Covariance (ANCOVA) at 0.05 level of significance. Estimated Marginal Mean" was used to determine mean differences of the groups.

Results and Discussion

Hypothesis 1: There is no significant difference in the pre-test mean score of students' attitude exposed to AI Assisted instructional and conventional teaching strategies in Biology.

Table 1: Analysis of Variance (ANOVA) for pre-test mean score of students' attitude in experimental and control groups

Groups	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	134.78	1	67.39		
Within Groups	10231.07	89	54.42	1.23	.29
Total	10365.86	90			

$p > 0.05$

Because the p value is (0.29) > 0.05 at the 0.05 level of significance, the data shown in Table 1 demonstrated that the F-cal value of 1.23 is not significant. As a result, the null hypothesis was not rejected. This suggests that there is no significance difference between the control group and the AI-assisted instructional strategy on the attitude of students' pre-test mean score. At the start of the study, the attitudes of the students in the groups regarding biology were homogeneous.

Hypothesis II: There is no significant difference between the pre-test and post-test mean score of students' attitude exposed to AI assisted instructional and conventional teaching strategies in Biology.

Table 2: Analysis of Covariance (ANCOVA) for Pre-test and Post-test Mean Scores of Students' Attitude under the Groups

Source	sum of square	df	Mean Square	F	Sig.	Eta^2
Corrected Model	4191.33	2	1397.11	33.199	.000	.348
Intercept	2215.990	1	2215.99	52.66	.000	.220
Pre-test	3183.140	1	3183.14	75.64	.000	.288
Methods	929.12	2	464.56	11.04	.000	.106
Error	7869.60	87	42.083			
Total	805057.00	90				
Corrected Total	12060.93	89				

a. R Squared = .348 (Adjusted R Squared = .337)* p < 0.05

The findings displayed in Table 2 demonstrate that the F-cal value of 11.039 is significant since the effect size (Eta2 =.106) of 10.6%, though small, is not negligible and the p value (0.000) < 0.05 at 0.05. The null hypothesis was thus not accepted. This suggests that there is a substantial difference in the mean score of pre-test and post-test of students' attitudes towards learning of Biology with AI-assisted instructional strategy and traditional biology teaching method. Table 3 is shown as follows to determine the size of the mean scores for the group performance:

Table 3: Estimated Marginal Mean of the Treatment group on Students' Attitude towards learning of Biology

Treatment Groups	N	Mean	Std Error
Assisted Instruction	80	63.54	.108
Conventional Teaching Method	49	62.02	.139

Based on the estimated marginal mean, AI assisted instructional strategy has higher post-test mean score (63.54) than conventional teaching method (62.02). Which implies that AI assisted instructional strategy improve student attitude better than conventional teaching method.

Hypothesis 3: There is no significant moderating effect of gender on students' attitude exposed to AI assisted instructional strategy and conventional teaching strategies in Biology.

Table 4: Analysis of Variance (ANOVA) of attitude of male and female students exposed to AI assisted instructional strategy and conventional teaching strategies in Biology

Groups	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	125.61	1	125.61	1.99	.160
Within Groups	11935.32	89	63.15		
Total	12060.932	90			

p>0.05

Table 4 presents the results, which indicate that the p-value (0.16) > 0.05 at 0.05 indicates that the F-cal value of 1.989 is not significant. Therefore, the null hypothesis was not rejected. This suggests that there is no discernible difference between the attitudes of male and female biology students exposed to AI-assisted instructional strategy and traditional teaching methods.

Hypothesis 4: There is no significant moderating effect of Mental Ability on student's attitude exposed to AI assisted instructional strategy and conventional teaching strategy in Biology.

Table 5: Analysis of Variance (ANOVA) of mental ability on student's attitude exposed to AI assisted instructional strategy and conventional teaching strategies in Biology.

Groups	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	197.34	2	98.67		
Within Groups	11863.60	88	63.10	1.564	.212
Total	12060.93	90			

p>0.05

From Table 5, the p value (0.212) is more than 0.05 at 0.05 level of significance, indicating that the F-cal value of 1.564 is not significant. So, the null hypothesis was not rejected. Therefore, the influence of mental capacity on AI-assisted instructional and traditional teaching strategies in biology is not statistically significant.

Discussion

The findings showed that, in the pre-test, students' attitudes towards the two techniques (both in the experimental and control groups) were low and did not significantly differ from one another. Based on the finding, the experimental and control groups were both homogeneous before to the study's start, indicating that the two groups' baseline attitudes were similar. Consequently, the notable variations in the outcomes are not coincidental; rather, they are a consequence of the treatment utilized.

The results of this study showed how treatment affects biology students' attitudes. The results indicate that when biology students are exposed to an AI-assisted instructional technique, their attitudes significantly alter because this method uses repetition, social contact, and technology to help with optimal assimilation and comprehension. These findings corroborate the observations made by Oladiran (2014) and Kingdom et al. (2019) about positive attitudes and strategy that encourage greater participatory learning. This study supports Audu's (2018) findings, which show that improving students' attitudes and performance in biology is facilitated by teachers utilizing effective teaching strategies throughout the teaching-learning process.

The results also show that gender has no discernible moderating influence on students' attitudes about biology. This demonstrates that there are no appreciable differences in the mean attitude scores of the students (male and female), regardless of the treatment and control groups to which they belong. This supports the findings of Oladiran (2014), Ogunleye (2019), and Ogundiwin (2013) that students' attitudes towards biology are unaffected by their gender.

Lastly, the findings of this study reveal that there is no significant moderating effect of mental ability on student's attitude exposed to AI Assisted instructional and conventional teaching strategies in Biology. This could be the effect of treatments on the students as the low achieving students (low mental level) are made to benefit from high achieving students (high mental level), though the highest contribution came from AI assisted instructional strategy High mental ability; while the least contribution came from conventional method moderate mental ability, but the differences in their respective means are not statistically significant. These results agree with Adeyemi & Awolere (2016) and Ogunleye, (2015) who

ideated that the effect of mental ability on attitude of students toward Biology is not significant.

Conclusion

The findings of the study established that the two groups (AI assisted instructional strategy and Conventional) were homogeneous before starting the experiment. The use of AI assisted instructional strategy and Conventional strategy improve students' attitude towards learning of Biology but AI assisted instructional strategy improve student attitude towardbiology better than conventional.

Recommendations

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

1. Senior secondary schools should implement the usage of AI-assisted instructional strategies, in order to improve student performance and attitude towards learning of biology.
2. The government should organize in-service training programs, workshops, conferences, and seminars for serving biology teachers to update their knowledge of the use of cutting-edge teaching strategies like AI Assisted instructional strategy in the classroom. These events should be organized in collaboration with a variety of organizations, including the Science Teachers Association of Nigeria (STAN), the All Nigeria Conferences of Principals of Secondary Schools (ANCOPSS), the National Union of Teachers (NUT), and faculties/institutes of education in the universities.

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FACTORS AGAINST SENIOR SECONDARY SCHOOL STUDENTS' PERFORMANCE IN ENGLISH WRITING SKILLS: THE TEACHERS AND LEARNERS' PERSPECTIVES

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Abstract

Writing skills are essential for academic success and effective communication in today's interconnected world. This study investigates the factors influencing senior secondary school students' writing performance in English in Ibadan North Local Government Area, Nigeria, from the perspectives of both teachers and students. Despite the importance of writing, students face challenges that raise concerns among examination bodies like WAEC and NECO regarding their writing competencies. Identified factors include socioeconomic influences, psychological barriers, ineffective instructional methods, and the impact of technology and social media. The research utilized a sequential exploratory mixed-methods design, involving 300 students and 10 teachers from selected public schools. Key findings indicate that poor family backgrounds, lack of parental support, and inadequate teacher training substantially hinder writing abilities. Psychological factors, such as fear of criticism and low self-efficacy, along with social media influence, further complicate writing development. The study recommended targeted interventions, such as improved teacher training, increased parental involvement, and the integration of technology in writing instruction, to create an environment conducive to developing strong writing skills and enhancing academic performance.

Keywords: English Writing Skills, Performance, Writing Instructions, Teacher Training

Introduction

English writing skills are essential for achieving academic success and facilitating effective communication in today's interconnected world. The ability to write effectively in English is a crucial skill for students, particularly at the senior secondary level, where academic performance can significantly impact their future educational and career opportunities. Studying writing skill is quite insightful as it gives a clear understanding of students' creativity, comprehension, and analysis of issues.

According to Cole and Feng (2018), academic success is subject to

enhancement in writing skills. While students may be effective speakers of English, they need guidance to become effective writers. They need to learn how to transfer their knowledge of grammatical concepts from oral language to written language. By connecting their knowledge of oral language to written language, teachers can demystify abstract grammatical terminology so that students can write and read with greater competence and confidence (Aremu, 2023).

In Nigeria, students' performance in English language writing skill can be assessed through Essay Writing, Summary, Comprehension, Letter Writing, among others. Essay writing is a form of academic writing that involves presenting a coherent and logical argument in response to a specific prompt or question. Secondary school students engage in series of examinations cutting across the various aspects of English Language with writing inclusive. Eexamples of such examinations are the yearly organised West African Senior School Certificate Examination (WASSCE) and National Examination Council (NECOSSCE). Students who do not possess strong writing skills will struggle to achieve the minimum passing grade, as the writing section (Paper 1) of the examination accounts for the highest percentage of the overall score (60%). This section assesses students' abilities to write various essays, including narrative, descriptive, expository, argumentative, speech, article, and both formal and informal letters.

Despite the critical role of writing, studies (Khan and Ukwuoma (2023), Aika (2020), Omotoyinbo (2020) have shown that secondary school students are deficient in writing skills. Both WAEC and NECO in their annual reports have expressed concerns regarding the inadequate writing skills demonstrated by students (WAEC, 2023; NECO, 2023), For instance, The WASC Chief Examiner's Report (2023) revealed that students' essays were marred by many issues. The report specifically identified challenges including poor sentence structure, limited vocabulary usage, inadequate organization of ideas and misuse of fundamental grammar rules as areas that necessitate immediate intervention.

Students' poor performance in writing skill has been attributed to various factors by researchers. Socioeconomic factors such as family background, parental education, and income levels can influence students' access to resources, a conducive learning environment, educational support, and exposure to English language learning opportunities. Students f rom disadvantaged backgrounds may have limited access to materials and support, affecting their writing skills (Bada, 2022). Students facing financial hardships may experience stress and distractions that will be hindrance to their academic focus. These can negatively impact their ability to

practice and develop their writing skills.

Psychological factor is another factor that plays a significant role in students' writing performance. A common barrier is the fear of criticism, which can be particularly ddemoralising for students who are not confident in their writing abilities. This fear mmight inhibit them from embracing risks and experimenting with extensive writing, limiting their development. Pajares (2021) noted that self-efficacy beliefs significantly impact students' writing motivation and performance.

Moreover, the influence of technology and social media can contribute to a decline in formal writing skills, as students increasingly gravitate toward informal communication styles. A study by Lenhart (2020) found that while technology provides opportunities for practice, it can also detract from the development of formal writing skills.

Teachers play a vital role in the teaching and learning process. According to Afolabi and Fakokunde (2021), their involvement is crucial for developing students' writing abilities. However, many teachers may not have received adequate training in effective writing pedagogy, which can lead to the adoption of outdated or ineffective teaching methods. This situation often leaves students without the necessary guidance to enhance their writing skills. Inadequate teacher training, a lack of knowledge in effective writing instruction techniques and large class sizes can restrict the individual attention and feedback that students require to improve their writing.

Research by Smith (2018) indicates that limited exposure to authentic English writing samples and insufficient practice with writing tasks hinder students' ability to produce coherent and cohesive written work. Johnson (2020) also noted that inadequate instruction in writing strategies, lack of motivation, and insufficient feedback opportunities contribute to poor writing performance among students. Additionally, Studies by Khan and Ukwuoma (2023) and Hernandez (2019) indicate that many students struggle with writing due to insufficient development in other language skills. The interconnection of reading, speaking, and writing skills among English learners is crucial, as limited reading comprehension and inadequate oral language proficiency can hinder students' ability to generate ideas, organize their thoughts, and produce coherent written work. For instance, writing relies heavily on the vocabulary a student has acquired; without exposure to language through reading and listening, retrieving those words becomes impossible (Khan and Ukwuoma, 2023). The interrelationship of language skills becomes particularly apparent when there is a deficiency in one area. Writing, for example, depends on a student's vocabulary and ability to retrieve words, which can only be cultivated through reading and

listening. If a student lacks exposure to these foundational skills, they may struggle to produce written work that meets the required length.

Previous studies confirm that students' deficient performance in English language writing skills stems from a variety of psychological, interpersonal, foundational, and social factors. However, there is scarcity of research exploring the factors influencing secondary school students' performance in English writing skills from the perspectives of the key participants in the teaching and learning process, specifically teachers and students. Consequently, this study aims to examine the writing skills of students in Ibadan North Local Government Area, with a particular focus on the factors affecting students' writing skills as perceived by both teachers and students from selected schools. This study has identified the factors influencing students' writing skills, providing valuable insights for examiners and teachers on how to effectively address these issues to help students enhance their writing skills.

Statement of the Problem

Proficiency in English, particularly in writing, is crucial as it not only enables effective expression but also fosters critical thinking and academic success. Strong writing skills allow individuals to convey their thoughts clearly, communicate ideas persuasively, and engage meaningfully in academic and professional discussions. Despite its importance, many secondary school students demonstrate deficiencies in writing skills, highlighting the need for a thorough investigation into the factors contributing to this challenge. Numerous studies have identified the obstacles students face in acquiring and demonstrating adequate writing skills, such as the necessity for authentic writing practice, effective instruction, motivation, and timely feedback. Understanding these factors is vital for developing targeted interventions and implementing evidence- based strategies to enhance students' writing skills and improve overall academic performance. However, previous studies have yielded inconclusive results, indicating a need for further research to explore the factors influencing secondary school students' performance in English writing skills as perceived by both teachers and students involved in the teaching and learning process. To address this research gap, the present study aims to investigate the perceived factors affecting students' writing skills in English Language among senior secondary schools in the Ibadan North Local Government Area, Nigeria.

Objectives of the study

The study set out to investigate the factors affecting students' writing skill in English language by teachers and students in Ibadan North Local Government Area, Nigeria. The specific objectives are to:

1. Investigate teachers' perceived

factors that influence the writing skills of students in Ibadan North Local Government Area.

2. Examine students' perceived factors that influence the writing skills of students in Ibadan North Local Government Area.

Research Questions

In this study, the researcher endeavored to find answers to the following questions;

1. What are the teachers' perceived factors that influence the writing skills of students in Ibadan North Local Government Area?
2. What are the students' perceived factors that influence the writing skills of students in Ibadan North Local Government Area?

Methodology:

This study employed a sequential exploratory mixed-methods design, incorporating both quantitative and qualitative approaches. This research design was utilized to investigate the factors affecting students' academic performance as perceived by the primary participants in the teaching and learning process - namely, teachers and students. The target population of the study included Senior Secondary School II students and their English Language teachers across all 42 public senior secondary schools in the Ibadan North Local Government Area, Oyo State.

From this population, ten public senior secondary schools were randomly selected. One teacher per school teaching the SSII class was purposively chosen, and a total of 300 SSII students (30 from each school) were randomly selected. The instruments used for data collection were the Teacher Perception of Factors Affecting Students' Performance in English Writing Skills questionnaire (r=0.79) and the Student Perception of Factors Affecting English Writing Skills questionnaire(r=0.79). Each of the instruments has 16 items covering demographics, background factors (such as family background, parental support, quality of primary education, parents' literacy level), teachers' factors (teaching method, teacher workload, specialization) and student factors (ability to read and speak English correctly, interest in education, sexual activeness, exposure to social media and new age short form language). The instruments were validated by expert lecturers in the faculty of education, university of Ibadan and feedback from them were used to improve the quality of the items.

The data were analyzed using descriptive statistics, including mean, frequency counts, percentages, and standard deviation.

Results

Table 1: Gender Distribution of the Teachers

Gender	Frequency	Valid Percent
Male	2	20%
Female	8	80%
Total	10	100%

Table.1 shows the gender distribution of the teachers' response. The result indicates that 20.0% were male while (80.0% were female.

Table 2: Gender Distribution of the Students

Gender	Frequency	Valid Percent
Male	84	28%
Female	216	72%
Total	300	100%

Table 2 shows the gender distribution of the students' responses. The result indicates that majority (72%) were female while 28% were male.

Research Question 1: What are the teachers' perceived factors that influence the writing skills of students in Ibadan North Local Government Area?

Table 3: Descriptive Statistics of Teachers' perceived factors affecting senior secondary students' performance in English language writing skill in Ibadan North LGA

S/N	ITEMS	To a great extent	Somewhat	Very Little	Not at all	Mean	St.D
1	The poor family background of the students affects their writing	5 (50%)	2 (20%)	3 (30%)	-	3.20	.919
2	Lack of parental support contributes to students' poor writing skill.	7 (70%)	3 (30%)	-	-	3.70	.483
3	Broken homes, single parenting affect students' performance in English Language writing skills.	5 (50%)	3 (30%)	2 (20%)	-	3.10	.738
4	Poor primary education affects students' writing skill at the secondary level of education.	7 (70%)	1 (10%)	2 (20%)	-	3.50	.850
5	The literacy level of parents affects the students' interest and zeal for classroom learning.	4 (40%)	5 (50%)	1 (10%)	-	3.30	.675

6	Hawking and vocational training contribute to students' poor performance in their writing skill.	5 (50%)	5 (50%)	-	-	3.50	.527
7	Skipping classes at the primary level affects students' performance in their secondary education.	7 (70%)	2 (20%)	1 (10%)	-	3.60	.699
8	The teaching method of the teacher affects how students understand the writing skill.	4 (40%)	4 (40%)	2 (20%)	-	3.20	.789
9	Too much workload on teachers affects their functionality in the classroom	4 (40%)	4 (40%)	2 (20%)	-	3.20	.789
10	Lack of specialist teachers to teach various aspects of Englishcontributes to students' poor writing skill.	3 (30%)	5 (50%)	2 (20%)	-	3.10	.738
11	The students' inability to read and speak English Language correctly affects their expression on paper.	9 (90%)	1 (10%)	-	-	3.90	.316
12	The students' lack of interest in education contributes to their poor writing skill.	5 (50%)	4 (40%)	1 (10%)	-	3.40	.699
13	The students' sexual activeness affects their concentration in class.	3 (30%)	5 (50%)	2 (20%)	-	3.10	.738
14	Social media and new age short-form languages affect the students' expression in English language.	6 (60%)	3(30%)	-	1 (10%)	3.40	.966
15	The language of the environment the students are exposed to at home affects their expression in English language.	8 (80%)	2 (20%)	-	-	3.80	.422
16	The feeling of inferiority among students affects their peer –to- peer learning.	5 (50%)	3 (30%)	2 (20%)	-	3.30	.823
Weighted Mean = 3.39; Threshold = 2.50							

Table 4.1.6 shows a weighted mean of 3.39 which is above the threshold set at 2.50. This indicates that the teachers' perceived factors were rated high. All the factors have their mean scores higher than the threshold.

Research Question 2: What are the students' perceived factors that influence the writing skills of students in Ibadan North Local Government Area?

Table 4: Students' perceived factors that influence Senior Secondary Students' performance in English language writing skill in Ibadan North LGA.

S/N	ITEMS	To a great extent	Somewhat	Very Little	Not at all	Mean	St.D
1	The poor family background of the students affects their writing.	121 (40.3%)	48 (16%)	66 (22%)	65 (21.7%)	2.75	1.197
2	Lack of parental support contributes to students' poor writing skill.	125 (41.6%)	56 (18.7%)	62 (20.7%)	57 (19%)	2.83	1.166
3	Broken homes, single parenting affect students' performance in English Language writing skill.	121 (40.3%)	61 (20.3%)	56 (18.7%)	62 (20.7%)	2.80	1.176
4	Poor primary education affects students' writing skill at the secondary level of education	137 (45.7%)	55 (21.6%)	50 (16.7%)	48 (16%)	2.97	1.125
5	The literacy level of parents affects the students' interest and zeal for classroom learning.	100 (33.3%)	78 (26%)	77 (25.7%)	45 (15%)	2.78	1.070
6	Hawking and vocational training contribute to students' poor performance in their writing skill.	128 (42.7%)	46 (15.3%)	66 (42%)	60 (20%)	2.81	1.189
7	Skipping classes at the primary level affects students' performance in their secondary education.	160 (53.3%)	52 (17.4%)	37 (12.3%)	51 (17%)	3.07	1.156
8	The teaching method of the teacher affects how the students understand the writing skill.	158 (52.7%)	42 (14%)	70 (23.3%)	30 (10%)	3.09	1.075
9	Too much workload on teachers affects their functionality in the	138 (46%)	78 (26%)	60 (20%)	24 (8%)	3.10	.987
10	Lack of specialist teachers to teach various aspects of English contributes to students' poor writing skill.	132 (44%)	59 (19.7%)	67 (22.3%)	42 (14%)	2.94	1.106
11	The students' inability to read and speak English Language correctly affects their expression on paper.	179 (59.7%)	40 (13.3%)	58 (19.7%)	23 (7.7%)	3.25	1.019

12	The students' lack of interest in education contributes to their poor writing skill.	145 (48.3%)	65 (21.7%)	55 (18.3%)	35 (11.7%)	3.07	1.064
13	The students' sexual activeness affects their concentration in class.	129 (43%)	62 (20.7%)	68 (22.7%)	41 (13.7%)	2.93	1.097
14	Social media and new age short-form languages affect the students' expression in English language.	109 (36.3%)	71 (23.7%)	62 (20.7%)	58 (19.3%)	2.77	1.138
15	The language of the environment the students are exposed to at home affects their expression in English language.	131 (43.7%)	52 (17.3%)	77 (25.7%)	40 (13.3%)	2.91	1.106
16	The feeling of inferiority among students affects their peer –to- peer learning.	120 (40%)	59 (19.7%)	70 (23.3%)	51 (17%)	2.83	1.135
Weighted Mean = 2.93, Threshold = 2.50							

Table 4. shows a weighted mean of 2.93 which is above the threshold set at 2.50. More explicitly, the result indicates that majority of the factors were rated high. All the factors perceived by the students have their mean scores above the threshold.

Discussion

The study involved ten public senior secondary schools, with participation from ten teachers and 300 students. It provided descriptive statistics reflecting both teachers' and students' perspectives on factors affecting students' performance in English language writing skills. The study analyzed demographic data of teachers and students, such as age range, gender, educational qualifications of the teachers, and their years of experience, reveal a higher number of female respondents. Quantitative data was processed using descriptive statistics, while qualitative data underwent thematic analysis to address research questions effectively.

Thematic analysis of interviews identified multiple factors perceived as detrimental to students' English writing performance, including poor family backgrounds, lack of parental support, inadequate primary education, and ineffective teaching methods. Other challenges included s tudents' difficulties in reading and speaking English, lack of motivation, and environmental influences like social media.

Descriptive statistics indicated that identified factors significantly contribute to students' difficulties in English writing skills, with an overall high rating of 3.39 above the threshold

of 2.50. Both teachers and students identified the inability to read and speak English correctly as a major barrier, reflected in teachers' mean score of 3.90 and students' mean score of 3.25.

The findings align with Osundare and Ayodele (2020) regarding language proficiency, inadequate instructional time, and limited exposure to authentic materials as barriers to writing skill development. Additional factors, particularly students' inability to read and speak English correctly, should be central to interventions aimed at enhancing writing skills. This study also supports Adekoya and Adeyemi (2022), who identified lack of interest and poor grammatical knowledge as significant contributors to writing issues. Akinwale (2021) suggests that explicit instruction in grammar, vocabulary, and sentence structure can boost students' motivation and improve their writing outcomes.

Conclusion

This study investigated perceived factors affecting secondary school students' English writing performance, as identified by teachers and students. Key factors included: poor family backgrounds, lack of parental support, broken homes, inadequate primary education, low parents' literacy levels, involvement in hawking and vocational training, class skipping, ineffective teaching methods, excessive teacher workload, absence of specialist teachers, students' difficulties in reading and speaking English correctly, lack of interest and motivation, poor concentration, social media influence, language used in their environment, and inability to study with peers. Both groups highlighted students' reading and speaking challenges as particularly significant, indicating an area needing attention for improving writing skills.

Recommendations

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

1. A culture of reading should be cultivated among students by offering a diverse selection of engaging and age-appropriate reading materials. Teachers should encourage students to read regularly and independently, both in and out of the classroom, to enhance their language comprehension and vocabulary acquisition to enhance their writing skills.

2. Teacher training programs should prioritize effective writing instruction to enhance teaching quality. Creating a safe and supportive classroom environment is essential for students to practice their English skills without fear of criticism. Educators should engage in training that promotes peer collaboration through techniques like scaffolding, group discussions, collaborative writing, peer review, and modelling. These methods will

help build students' confidence, encourage active participation, and improve overall language proficiency while fostering a positive attitude toward language learning.

3. Schools should implement writing clubs, peer review groups, and workshops to allow students to share their work and receive constructive feedback, fostering a collaborative culture that encourages writing expression. Engaging parents in their children's English language development is crucial, providing them with resources and guidance for supporting language learning at home. Additionally, opportunities for students to interact with local authors can inspire them and enhance their appreciation for writing.

4. Both the government and educators should incorporate technological tools, such as language learning apps, online resources, and interactive multimedia, to engage students and expand opportunities for language practice. Utilizing technology, including writing applications and online workshops, can significantly enhance students' writing skills and overall language proficiency.

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GENDER EMPOWERMENT AND ECONOMIC GROWTH IN NIGERIA

By

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Abstract

This study analyzed the impact of gender economic empowerment on economic growth in Nigeria. Economic empowerment was decomposed into three, labour participation, employment and education. Nigeria like other countries of the world is faced with the problem of inequality and achieving gender equality in all spheres of empowerments will help in attaining the sustainable development goals. Secondary data collected from World Development Indicators, World Bank Data Bank from 1990 to 2022 were analysed using Auto-Regressive Distributive Lag (ARDL) estimation techniques. Results show that female labor force participation positively impacts economic growth in the long run. However, short run estimates revealed that while increase in female labour force participation impacted growth negative, male labour force participation was growth-enhancing. In addition, female employment and male employment have positive and negative impact on growth respectively. However, male and female education enrolment had insignificant impact on growth in the short run. This study hence recommends that government should make labour market policies that are gender sensitive and that can boost employment and labour participation in the country. Also, education should be prioritized.

Keywords: Gender, Economic Empowerment, Growth, Labour, Employment

Introduction

Gender equality is central to human right and this right is contravened by gender discrimination (United Nations, 2014). Gender inequality is a form of discrimination on the basis of sex, making one gender to be preferred or prioritized over another. This creates problems for boys, girls, men and women in realizing and exercising their full potentials and in enjoying equal human rights. Every child deserves an equal chance to breathe, survive and thrive. All over the world, countries and societies vary in terms of values and cultural norms, gender roles and context also vary from place to place.

Gender discrimination starts from childhood or even from birth, and this limits the lifelong capability and potentials of children and their empowerments as adult (Save the Children, 2023). Gender empowerment is the empowerment of any gender, either female or male. Empowerment that is devoid of gender bias and discrimination is crucial in achieving gender equality (Ejemudo, 2013). Conventionally, gender equality is focused on women, this is because women have fewer economic opportunities than men, lesser access to education, greater health risks and lesser political participation in most countries of the world (Revenga and Shetty, 2012). Ensuring that they reach their full potentials will not only guarantee gender equality but will also meet a wider range of national and international development goals.

Moreover, about half of the world's population is women and girls, hence half of its potential is untapped (United Nations, 2023). Hence, it is important that these human resources are maximally used in the economy. When more women work, it boosts the economy. Gender equality is required to achieve peaceful societies with full human potential and sustainable development. Much as empowering women and girls improve productivity and economic growth, achieving equal opportunities in access to employment and to leadership positions and decision-making at all levels is of great importance in ending all forms of gender bias, violence and in securing equal access to health care, quality education, economic resources and in political participation. Gender equality is associated with higher per capita income and greater economic growth (World Bank, 2023)

While women empowerment is important, inequalities and inequities are embedded in uneven dynamics that disproportionately empowers one sex than another. Men also need to be active participants in the redistribution of power between genders. There is need to encourage behavioral change in men and boys and engage them as allies. This is because (i). gender equity cannot be achieved without the male counter-part, (ii). men's power can serve as an effective advocate and (iii). masculine norms usually affect outcomes for men and women (Amaya, Schroder, Medrano & Geertz, 2019). Closing the gender gap between the economic empowerment of men and women improves families and community livelihood. It encourages entrepreneurial behaviors and promotes economic growth. Also, efforts geared towards gender equality are investments to generate future income through beneficial developmental impacts which brings about enormous economic gains.

Considering the effects of female and male labour force participation on economic growth Anyanwu and Adesanya (2021) examined the impact

of female labour force participation on economic growth in Nigeria, using ordinary least squares to analyze data from 1981 to 2015. The study showed that female labour force participation negatively impact growth. In line with this Thaddeus et al (2022) used autoregressive distributive lag (ARDL) and granger causality to investigate the contribution of female labour force participation on economic growth in 42 sub-Saharan African countries from 1991-2019. Results from the study showed that a negative relationship exists between female labour force participation in the long run, however, in the short run this relationship was insignificant. However, in Western Balkan countries, Jusaj and Fetai (2022) assessed the impact of female education on economic growth. The study used ordinary least square, fixed and random effects for the period between 2000 and 2009. The study's results revealed that female labour force participation and GDP per capita had significant positive effect on economic growth, while school enrolment in tertiary education was not significant in enhancing growth. Also, Omran and Bilan (2022) conducted a study on female labour force participationand economic development in Egypt, using Vector Error Correction Model (VECM). The study discovered that female labour force participation impacted growth positively in the long run.

In knowing the effect of education on economic growth on gender basis, Khan, Yasmeen and Karim (2019) assessed the role of female education in the national economic development of Pakistan. Using ordinary least square, results showed that female secondary education, female primary education and tertiary education positively impacted growth in Pakistan. Oztunc, Zarchi and Serin (2015) randomly collected data in eleven (11) selected Asian pacific region and used balanced panel of 231 observations between 1990 and 2010. The study examined the extent to which women's education affects their long term growths. The results showed that female education and female adult literacy rate have significant positive relationships with long term growth in eleven (11) selected Asian pacific region. Moreover, a study on the effects of male and female education on economic growth in Asia was conducted by Hassan and Cooray (2014). The study adopted Extreme Bounds Analysis (EBA) to investigate the comparative growth effects of gender disaggregated and level specific enrolment ratio in a panel of Asian countries. The result obtained was suggestive of a gender productivity gap and it was advised that Asian economies will grow faster if they invest more on female education. The gender effects of education on economic development was analyzed by Tansel and Gunger (2012) in 67 provinces in Turkey using regression analysis. It was shown from the result that female education was significant and positively impacted growth while

male education was insignificant enough to impact growth in Turkey. Moreover, Igboanugo and Iwegbu (2020) examined the impact of gender equality in education and economic growth in Nigeria. The study used error correction model (ECM) and adopted the neo-classical feminist theory in model building. It was revealed that gender inequality has a significant effect on education, and female education impacted economic growth negatively. Furthermore, in South Africa Ruiters and Charteris (2020) used Auto-Regressive Distributive Lag (ARDL) for a quarterly data from 2008 to 2018 in order to know the effects of development in gender equality in labour force participation. The results showed that while economic growth has positive impact on gender equality, female labour force participation has no significant effect on growth. In addition, Taasim and David (2020) investigated the effects of gender unemployment on economic growth of BIMP-EAGA from 1990 to 2018 using fully modified OLS and dynamic OLS. It was discovered that a significant negative relationship exist between male unemployment and economic growth and female unemployment has no significant impact on growth.

Statement of the Problem

Gender equality is a human right issue and an essential requirement for a just and inclusive society. Even though significant progress has been made in recent times, achieving gender equality and equity remains a challenge. World Economic Forum (2018) showed that Nigeria ranked 133 among 149 countries of the world surveyed for gender gap reduction. And by 2020 the country's position in gender gap reduction improved to 128 out of 153 countries. The report stated that Nigeria was among the countries with the most improved performance on economic participation and gender parity (World Economic Forum, 2020). Women access to education, health care facilities and economic opportunities has improved and more women are now seen in the work force and in politics. Awareness has increased, gender stereotypes have been voiced against and there is an on-going recognition of the importance of inclusivity.

Despite this progress, there are several challenges hindering the achievement of gender equality and empowerment in Nigeria. Gender bias and discrimination persist at different forms and degrees, such as male dominated industries, unequal pay, barriers in career advancement for women, societal norm and cultural attitudes strengthens gender injustice. Though the Section 17 of the Nigerian 1999 constitution makes provisions for gender equality and non-discrimination, yet women and girls continue to experience marginalization, abuse and injustices in all spheres of life. Consequently resulting to gender stereotypes, low levels of education, discriminatory

laws, religious and cultural values, and the uneven effect of poverty on women. According to National Bureau of Statistics (2021) there was a gender gap of 3.2 percent in unemployment. The sectoral analysis of women participation in the economy showed that women lagged behind in 10 sectors out of 13. Women are marginally at advantage in education sector, health sector and trade sector (Partnership for Advancing Women in Economic Development, 2023).

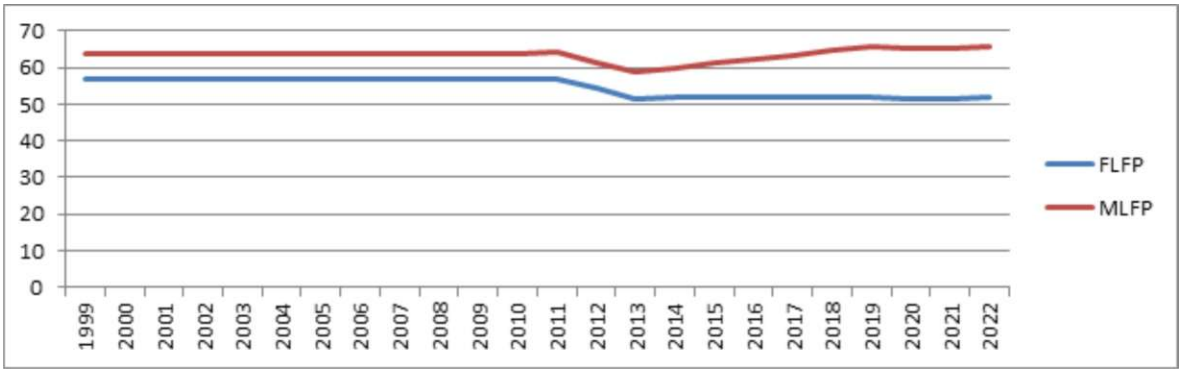
Nevertheless ensuring equal opportunities and participation in the economy can serve as a spring board to faster recovery from recent shocks such as COVID 19 pandemic. Also it can provide strong foundation of growth for more sustainable, resilient and inclusive economy. It enhances economic efficiency, stimulates and boosts private and public sector performance and hence bridges the income inequality gap.

This study is significant as existing studies on gender and economic empowerment focused on women based on the fact that women are the ones marginalized or oppressed (Dungan and Akyus, 2017 Not Referenced); Anyanwu and Adesanya, 2021; Thaddeau, 2022). Historically, women have comparatively been subjected to oppression, violence and injustice both in their private and public life. Also, it is important to note that both female and male constitute labour force and hence the need to know their individual impact on the economy. This study is unique as it used data on male employment, male labour force participation and male education. It then looks at the effects of male and female economic empowerment on growth in Nigeria.

Trends and Development of labour force participation in Nigeria

With secondary data collected from the World Development Indicators, World Bank Data Bank website, figure 1 presents labour force participation in Nigeria from 1999 to 2022. The figure shows that female labour force participation was stable at about 57 percent of female population age 15 and above between 1999 and 2011. This is against male labour force participation of about 64 percent for the same period. Thereafter, there were negative growth for both sexes in 2012 of 4.51 percent and 4.00 percent for female labour participation and male labour participation respectively. And in 2013 labour force participation has decreased to 52 percent and 59 percent for female and male respectively. Also, there was a drop in 2020 for both sex. However the fall in labour participation in 2011 and 2020 can be attributed to the aftermath of the two successive economic recessions (2007; 2009), naira depreciation, insecurity and impact of COVID-19 on the economy in 2020.

Figure 1: Gender Analysis of Labour Force Participation (1999-2022)



Source: Author's computation (2024) Data used are collected from World Development Indicators, World Bank Data Bank

The effect of COVID-19 pandemic can be seen in the decrease in female labour participation from 52 percent to 51 percent and male labour force participation from 65 percent to 64 percent. From 2013 to 2022 (about 10 years), there was no significant improvement in female labour force participation in Nigeria, while male labour force participation improved to 65 percent. It is important to note that gender gap in labour force participation has relatively increased compared to what we had in 1999, from 6.8 difference in 1999 to 13.5 difference in 2022. Figure 1 shows that whatever dropped labour force participation in 2011 has significant negative impact on female than for male. Female labour force participation has not recovered since then (the last 10 years).

Growth in labour force participation is presented in table 1, in an interval of 4 years. The growth rate is used to express a percentage change in a variable. This is calculated by finding the difference between present and previous year divided by previous year multiplied by 100

$$\left[\frac{y_t - y_{(t-1)}}{y_{(t-1)}}\right] \times \frac{100}{1}$$

While a positive growth rate indicates an increase over time, a negative growth rate indicates a decrease over time. The growth rate helps in assessing the performance of a variable of interest and also in predicting its future growth. Female labour force participation had a positive growth of 0.05 percent between 1999 and 2003. This was followed by gradual negative growths of 0.15 percent and 0.16 percent from 2003-2007 and 2007-2011 respectively.

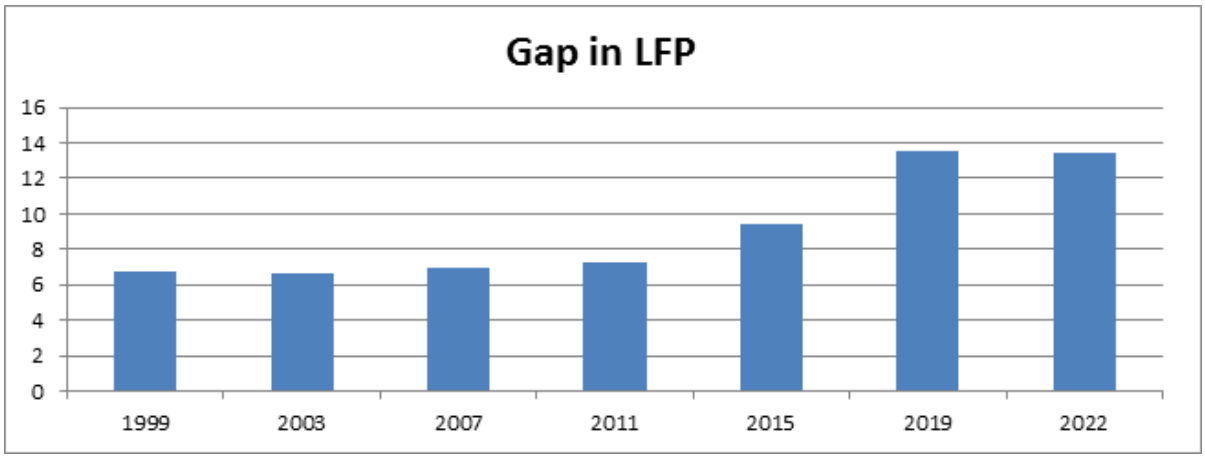
Table 1: Gender analysis of Growth in Labour Force Participation

Year	FLFP	Growth in FLFP	MLFP	Growth in MLFP	Gaps in LFP
1999	56.899	-	63.661		-6.762
2003	56.927	0.04921	63.57	-0.14294	-6.643
2007	56.844	-0.1458	63.807	0.372817	-6.963
2011	56.751	-0.16361	64.051	0.382403	-7.3
2015	51.746	-8.81923	61.168	-4.5011	-9.422
2019	52.046	0.579755	65.602	7.248888	-13.556
2022	52.088	0.080698	65.539	-0.09603	-13.451

Source: Author's computation (2024) Data used are collected from World Development Indicators, World Bank Data Bank

However, between 2011 and 2015 there was a negative growth of 8.82 in female labour force participation. Even though the growth has been positive since then, yet the impact has not been significantly felt. On the other hand, male labour force participation experienced a negative growth of 0.14 from 1999 to 2003. The growth in male labour force participation was positive for the periods 2003-2007 and 2007-2011 with about 0.38 percent. Since 2011 the growth in male labour force participation has been unstable (it was either positive or negative) but the percentage of male participation in labour force was fair in 2022 relative to the percentage of female participation in labour force. This implies that even though there is no significant improvement in female and male participation in the Nigerian labour market, yet the gender gap in labour participation widened. It means that increase in Nigeria's population does not improve the labour participation and also the effect of patriarchal ideology in respect to women working outside home still persists. Other factors are brain drain, insecurity, and poor working environment.

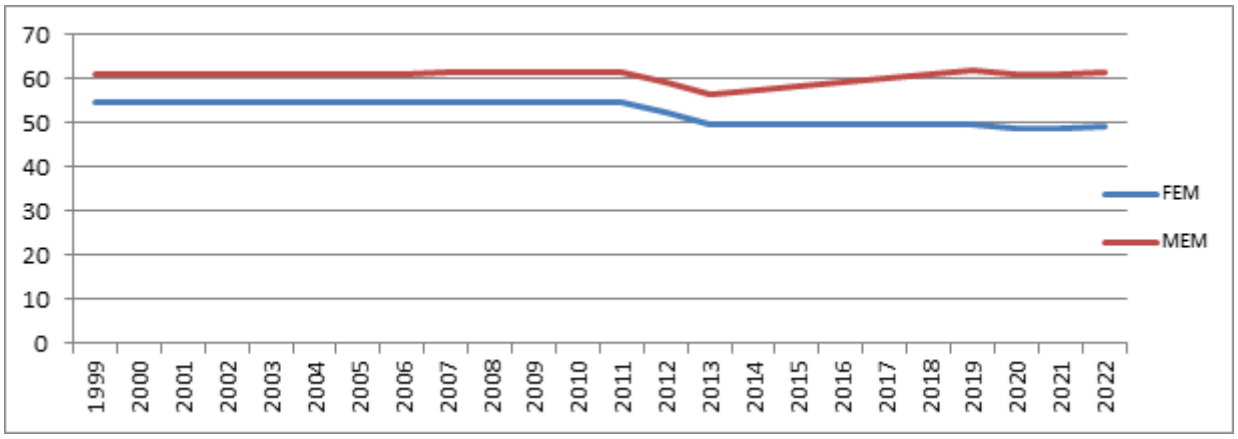
Figure 2: Gender Analysis of Employment (1999-2022)



Source: Author's computation (2024) Data used are collected from World Development Indicators, World Bank Data Bank

The gap in labour force participation is the percentage difference between female and male labour force participation. It can be seen from figure 2 that between 1999 and 2022, the gap has increased over the years in disfavor of female (about 98.9 percent growth between 1999 and 2022). Several factors can be responsible for this gap ranging from work-family balance, patriarchal ideology to absence of comprehensible policy for female emancipation via training, education, access to credit, resources and technology.

Figure 3: Gender Analysis of Employment (1999-2022)

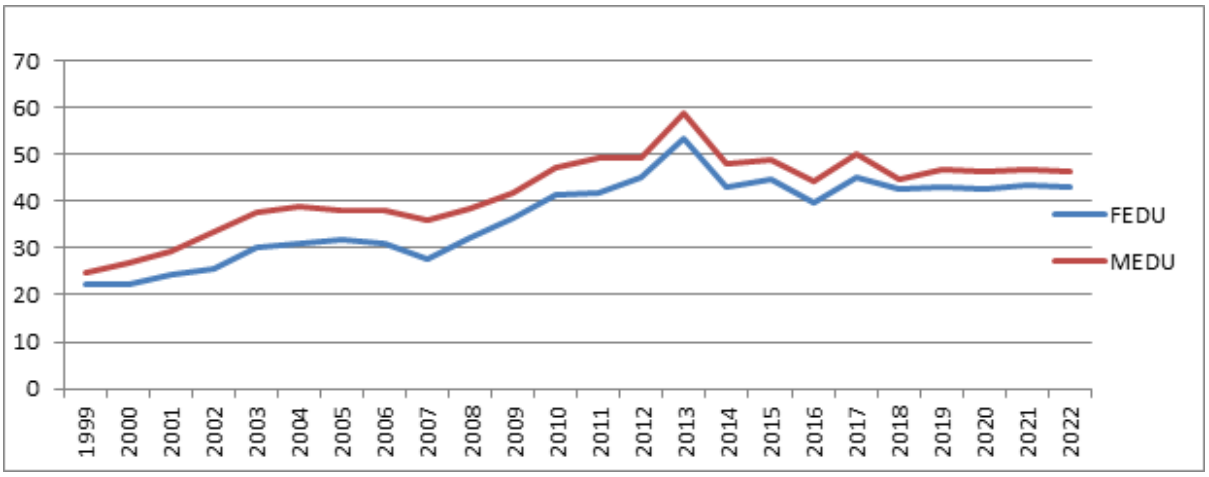


Source: Author's computation (2024) Data used are collected from World Development Indicators, World Bank Data Bank

Female employment according to International Labour Organization (International Labour Organisation, 2023) is the percentage of female population aged 15 and above who during a short reference period were involved in any activity to produce goods or services for pay or profit. This is either at work during the reference period (i.e who worked in a job for at least one hour) or not at work due to temporary absence from a job or to working time- arrangements. Female Employment (FEM) is the proportion of female working population that is employed. In the same vein, male employment is the percentage of male population aged 15 and above who during the reference period were engaged in activities to produce either goods or services for pay or profit. Male employment (MEM) is the proportion of male working population that are gainfully employed. The figure shows that female employment was stable at 55 percent, while male employment was stable at 61 percent between 1999 and 2011. Both female employment and male employment dropped in 2011 and in 2013 they both started increasing gradually. However, in 2020 there was also a decrease in the percentage of female and male that were employed. Nevertheless, by the year 2022 the gap between the percentage of female employed and male employed has widened. While female employment dropped from 54.7

percent in 1999 to 49.2 in 2022, male employment relatively improved from 61.2 percent in 1999 to 61.6 percent in 2022. Globally, about 64 million women lost their jobs due to COVID-19 pandemic (IMF, 2022). This is twice as much as that of men. Employers are more likely to cut down labour with lower pay and less social protection e.g informal, temporary and part-time jobs. These are the jobs mostly dominated by women.

Figure 4: Gender Analysis of Secondary School Enrolment (1999-2022)



Source: Author's computation (2024) Data used are collected from World Development Indicators, World Bank Data Bank

Female secondary education enrollment is female enrollment percentage of gross enrolment. According to UNESCO Institute for Statistics (2022 NR) gross enrollment ratio is the ratio of total enrolment irrespective of age, to the total population of the age group that officially corresponds to the level of education. Broadly speaking, the enrolment rate in secondary schools is low for both male and female (below 25 percent). As depicted in figure 4, this rate was unstable over the years for both sexes but reached its peak in 2013 at 53.5 percent and 58.8 percent for female secondary and male secondary enrolment respectively, then was decreasing till 2022.

Materials and Methods

In order to investigate the impact of gender economic empowerment on economic growth in Nigeria, the model is expressed thus;

In this study, economic empowerment can be seen in three ways; labour force participation, employment and education. Each form of economic empowerment is decomposed into male and female in order to know the gender effect of economic empowerment.

$GDPg_t = \alpha_0 + \alpha_1 FLFP_t + \alpha_2 MLFP_t + \alpha_3 FEM_t + \alpha_4 MEM_t + \alpha_5 FSEN_t + \alpha_6 MSEN_t + \mu_t$ .....(1)

GDPg represents economic growth, FLFP and MLFP are female labour force participation and male labour force participation respectively. FEM

and MEM are female employment and male employment respectively, while FSEN is female secondary education enrolment and MSEN is male secondary education enrolment. A time series secondary data from 1990 to 2022 were collected from World Development Indicators, World Bank Data Bank website. Variables are expressed in growth rate and 't' represents time (1990-2022). The study employed auto-regressive distributive lags as the estimation technique.

Description of Variables and Measurement

1. Gross Domestic Product – This is an annual percentage growth rate of Gross Domestic Product (GDP) based on constant local currency. Gross Domestic Product (GDP) is the total of all value added by resident producers in the economy plus taxes and minus subsidies. This is calculated without allowance for depreciation of assets or depletion of natural resources. This is the dependent variable in this study
2. Female Labour Force Participation – Female labour force participation is the proportion of female population ages 15 and above that is economically active (International Labour Organization, 2023 NR). This represents female who supply labour for the production of goods and services for a specified period of time. Theoretically, there is positive relationship between female labour force participation and economic growth. An increase in the proportion of female who supply her labour services will boost the growth of the economy, since both female and male make the human resources a country has. More importantly, female constitutes about half of the world and Nigeria's population.
3. Male Labour Force Participation - Male labour force participation is the proportion of male population ages 15 and above that is economically active (International Labour Organization, 2023 NR). This represents male who supply labour for the production of goods and services for a specified period of time. Also, the a-priori expectation of the relationship between male labour force participation and economic growth is positive. Increase in male labour force participation will increase economic growth.
4. Female employment – This represents the proportion of female population ages 15 and above that is employed. Here, employment is defined as female of working age who during a short reference period was engaged in any activity meant for the production of goods and services for pay or profit, whether at work during the specified period. These are women who worked in a job for at least one hour or not at work due to temporary absence from a job or to flexible working

time arrangement.

5. Male employment - This is the proportion of male population ages 15 and above that is employed. Here, employment is defined as male of working age who during a short reference period was engaged in any activity meant for the production of goods and services for pay or profit, whether at work during the specified period. These are women who worked in a job for at least one hour or not at work due to temporary absence from a job or to flexible working time arrangement.

   It is expected that increase in female and/or male employment will increase economic growth in Nigeria.
6. Female secondary education – This is female secondary school enrolment, percentage of its gross enrolment. Gross enrolment is the ratio of total enrolment irrespective of age to the population of the age group that officially corresponds to the level of education shown. Secondary education completes the education at primary level.
7. Male secondary education - This is male secondary school enrolment, percentage of its gross enrolment. Gross enrolment is the ratio of total enrolment irrespective of age to the population of the age group that officially corresponds to the level of education shown.

   Education is a form of investment in human resources. Increase in education will increase the number of skilled workers in the economy. This has a positive impact on the economy.

Results and Discussion

The summary of statistics of all variables as depicted in table 2 shows that male labour force participation has the highest mean value of 61.5294 and GDP growth has the least mean value of 4.2877. In addition, male secondary education enrolment has the highest standard deviation (22.6503) and the least standard deviation of 1.3371 is seen with male employment. This means that male employment is relatively stable with low variability, while male secondary education enrolment is relatively unstable with high variability. Furthermore, the results of skewness reveal that all variables are negatively skewed except GDP growth (GDPG) and female secondary education enrolment (FSEN).

Table 2: Summary of Statistics

	GDPG	FLFP	MLFP	FEM	MEM	FSEN	MSEN
Mean	4.2877	53.5804	61.5294	52.9498	60.9596	9.4865	25.9538
Std. Dev	3.9583	9.8759	11.1289	2.4103	1.3371	18.5831	22.6503
Skewness	0.4650	-5.0468	-5.3528	-0.8108	-1.8837	1.4149	-0.2996
Kurtosis	3.3895	27.9295	30.1146	1.7717	6.0372	3.0121	1.0990

Source: Authors' (2024)

All variables of interest are greater than 3 except female employment (FEM) and male secondary education enrolment (MSEN). Growth in gross domestic product (GDPG), female labour force participation (FLFP), male labour force participation (MLFP), male employment (MEM) and female secondary education enrolment (FSEN) are greater than 3. This implies that the distribution of these variables are thicker than the normal distribution and hence imply the presence of heterogeneity in data.

Correlation Matrices

To explain the relationship among the variables of interest, table 3a shows the correlation matrix of economic growth and all forms of economic empowerment for men and women. The result shows that GDP growth rate (GDPG) has a positive and significant relationship with female employment (FEM). Female labour force participation has a positive and strong relationship with male labour force participation, but it shares a relatively weak relationship with female employment (FEM).

Table 3a: Correlation Matrix of Gender Economic Empowerment

	GDPG	FLFP	MLFP	FEM	MEM	FSEN	MSEN
GDPG	1.0000						
FLFP	0.1217	1.0000					
MLFP	0.0252	0.9744***	1.0000				
FEM	0.3617**	0.4864***	0.2957	1.0000			
MEM	-0.0378	0.0607	0.0209	0.5246***	1.0000		
FSEN	-0.1015	0.1160	0.0951	0.1554	0.1177	1.0000	
MSEN	0.5917***	0.2354	0.1389	0.2630	-0.4225**	-0.1525	1.0000

Source: Authors' computation (2024).

While at 5 percent level of significance female employment (FEM) and male employment (FEM) have a mild positively and significant relationship, there is a negative relationship between male employment (MEM) and male education enrolment (MSEN). This implies that an increase/decrease in female employment will increase/decrease male employment. However, an increase/decrease in male secondary education enrolment will lead to decrease/increase in male employment.

Table 3b: Correlation Matrix of Gender Ratios and Growth

	GDPg	**RLFP**	**REM**	**RSEDU**
GDPg	1.0000			
RLFP	0.4309**	1.0000		
REM	0.4482***	0.9986***	1.0000	
RSEDU	-0.5432***	-0.7467***	-0.7350***	1.0000

Source: Authors' computation (2024)

In table 3b, ratio of labour force participation and ratio of employment has a significant positive relationship with growth in gross domestic product (GDPg). However, a significant and negative relationship exists between GDP growth and ratio of secondary education. Moreover, ratio of labour force participation has positive and negative relationship with ratio of employment and ratio of secondary education respectively. Ratio of employmenthas a negative relationship with ratio of secondary education.

Unit root test

Table 4 presents the result of the stationary test performed using ADF unit root test. The result shows that all variables are stationary at first difference except GDP growth rate (GDPG) which is stationary at level. Female labour force participation (FLFP), male labour force participation (MLFP), female employment (FEM), male employment (MEM), female secondary school enrolment (FSEN) and male secondary school enrolment (MSEN) are stationary at first difference I (1).

Table 4: Unit Root Test

Variables	ADF test Statistics	Critical value @ 5 percent	Prob.	Order of Integration
GDPG	-3.6833	-2.9571	0.0093	I(0)
FLFP	-5. 3350	-2.9919	0.0002	I(1)
MLFP	-9.2349	-2.9919	0.0000	I(1)
FEM	-3.6833	-2.9571	0.0068	I(1)
MEM	-3.6253	-2.9919	0.0129	I(1)
FSEN	-10.9236	-2.9604	0.0000	I(1)
MSEN	-6. 4704	-2.9919	0.0000	I(1)

Source: Authors' computation (2024).

The Impact of Economic Empowerments on Economic Growth

Since the results from stationarity test show the combination of I(0) and I(1) of GDP growth rate female labour force participation (FLFP), male labour force participation (MLFP), female employment (FEM), male employment (MEM), female education (FSEN) and male education (MSEN). This paper proceeds by using ARDL procedures, starting with bound co-integration test for the relationship between economic growth and gender economic empowerments.

In table 5, the computed F-statistic of 8.2518 is greater than the upper bound at 5% significant level (that is, 8.2518 > 3.61) and also greater than the lower bound at 5% significant value (that is, 8.2518 > 2.45).

Table 5: ARDL Bound Cointegration test

Critical Value Bounds		
Computed-F-statistics 8.2518		
Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
1%	3.15	4.43

Source: Authors' computation (2024).

The lower bound is represented as I_0 and the upper bound is represented as I_1. Hence, we reject the null hypothesis that there is no co-integration, that is, there is a long run relationship among variables.

Table 6: Estimated Long-Run Coefficients using the ARDLApproach 2

Variable	Coef.	Prob.
FLFP	46.224773	0.0725
MLFP	-8.607808	0.3915
MEM	2.234903	0.8265
FEM	-41.643495	0.1016
FSEN	-0.015422	0.7885
MSEN	-0.056879	0.4131

Source: Authors' computation (2024).

Table 6 shows the results of the estimated ARDL long-run coefficients for gender economic empowerments and economic growth in Nigeria. The result shows that all the variables have negative impact on economic growth except female labour force participation and male employment. However, none of the variables is significant enough to impact economic growth in Nigeria.

Short Run Estimates of Gender Economic Empowerment and Economic Growth

The short run estimates in table 7 shows that a unit increase in year 1 lagged of economic growth ($GDPG_{t-1}$) leads to 0.2973 unit increase in current economic growth ($GDPG_t$), showing a positive relationship between past and present economic growth in Nigeria for the period under study. Also, a unit increase in female labour force participation (FLFP) leads to decrease in economic growth by 94.5515 unit. A unit increase in year 1 lagged of female labour force participation ($FLFP_{t-1}$) increases economic growth by 157.9237 unit. On the other hand, a unit increase in male labour force participation increases economic growth by 75.2835 units. While its lagged year 1 negatively impacts economic growth.

Table 7: Estimated Short Run Estimates

Variable	Coefficient	Prob.
GDPG(-1)	0.2973	0.0718
FLFP	-94.5515***	0.0014
FLFP(-1)	157.9237***	0.0004
FLFP(-2)	-30.8909**	0.0498
MLFP	75.2835***	0.0014
MLFP(-1)	-81.3321***	0.0014
MEM	-69.9691***	0.0027
MEM(-1)	71.53957***	0.0021
FEM	100.1503***	0.0022
FEM(-1)	-169.125***	0.0004
FEM(-2)	39.71261**	0.0355
FSEN	-0.01084	0.7882
MSEN	-0.03997	0.3805
ECM_1	**-0.7027 (0.0003)**	
R^2	**0.8333**	
Durbin Watson	**1.8262**	
Fstatistics (Prob)	**6.5415 (0.0003)**	

Source: Authors' computation (2024).

Male employment negatively impact growth, such that a unit increase in male employment decreases economic growth by 69.9691 units. Meanwhile the lagged year 1 of male employment has a significant positive relationship economic growth. A unit increase in previous year male employment increase economic growth by 71.5396 units in the short run. However, while increase in female employment increases economic growth, increase in the lagged year 1 of female employment decreases economic growth by 169.125 units.

On the other hand, female secondary education enrolment and male secondary education enrolment negatively impact growth but they are both insignificant. The R^2 shows that the independent variables account for over 83 percent variation in the dependent variable (GDPG) in all the models. The Error Correction Model, $ECM_{(-1)}$ term showed the adjustment or feedback mechanism which shows the rate at which disequilibrium in dependent variable poverty (GDPG) is being corrected in the long run. The ECM term here is negative and significant at 1 percent. It therefore confirms that there is long-run relationship in the model. It shows that disequilibrium in GDPG is corrected by 70.27 percent annually.

The results of the various diagnostic tests show that the estimated model passed the various confirmation tests. Results obtained can be seen in the appendices.

Discussion of Findings

Though the results from the ARDL conducted revealed a long run relationship among variables of interest, only female labour force participation was found to significantly impact economic growth in the long run and at 10% level of significance. It shows that economic growth increase with increase in the long run. On the other hand, short run estimates show that changes in previous economic growth is significantly related to economic growth in the current year. This shows a positive relationship between past and present economic growth for the period under study. Also, the results show that economic growth decreases with increase in female labour force participation. This corroborates the findings of Anyanwu and Adesanya (2021) in Nigeria and Thaddeus et al (2022) in 42 sub-Saharan countries. Results from both studies established a negative relationship between female labour force participation and economic growth. Thaddeus el at (2022) discovered that female labour force participation negatively impact economic growth in the long run, while this relationship was insignificant in the short run. This finding was in agreement with Goldin's theory which states that female labour force participation decreases in the early stage of development as growth

increases. However, changes in previous female labour force participation positively impact present economic growth. This may be due to the fact that the quality of labour determines growth not necessarily the quantity. Existing female in the labour market could have acquired the needed skills and education to contribute significantly to growth. In addition, changes in present male labour force participation positively impact economic growth.

While female employment positively impacts economic growth, male employmentimpacts growth negatively. Increase in the number of female who are gainfully employed improves growth and increase in the number of male who are employed decreases growth. Given the population of female and their share of the country's human resources, it is expected that their contributions to the economy is significant and growth enhancing. When income is in the hands of women, they put it into productive use such as in children education and nutrition, thereby invest into the future. They tend to provide the spring board for which families can move out of poverty. However, men increase leisure as income increase.

Furthermore, the results show that economic growth decrease with increase in male and female education. As the number of men and women who are educated is increasing, economic growth is decreasing. However, this relationship was not significant. Increase in number of female and male that are educated is not strong enough to impact economic growth in Nigeria for the period under study. This finding was in line with the result of Jusaj and Fetai (2022) on the effect of female education on economic growth in Western Balkan countries. The study discovered a negative impact of school enrolment on economic growth. On the other hand, Tansel and Gunger (2012) discovered an insignificant impact of male education in 67 provinces in Turkey. This may be due to the fact that not all that are educated are gainfully employed and contribute to economic growth in Nigeria for the period under study. The possibility may also lie in the fact that needed skills and technicality required for growth are not the ones obtained by job seekers. Another reason is brain drain. People are living the country every day in search of greener pasture and this is a kind of disadvantage to the economy.

Conclusion

The study revealed that while female labour participation impacts growth negatively, increase in male labour participation is growth-enhancing. Conversely, increase in male employment is negatively related to economic growth and increase in female employment is growth-enhancing. However, education irrespective of the gender is not significant enough for economic growth.

Policy Recommendations

i. Government should make labour market policies that are gender sensitive and that can boost employmentand labour participation in the country
ii. School curriculum should be structured in a way that it will meet the needs of the economy. Government should spend more on education.
iii. Also, there is need to discourage emigration, particularly of its abled bodied and well-educated men and women. This can be achieved by making work places convenient (through the provision of needed infrastructure and basic supportive systems) and improving the welfare of the citizens.
iv. Other issues that can discourage labour participation and employment should be addressed. Example of such are insecurity, non-availability of child care facilities for working women e.t.c

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FLEXIBLE WORK SCHEDULES IN POST COVID-19 ERA IN CANADA: LESSONS FOR NIGERIA

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Abstract

A careful study of recent literature reveals that, the advancement in technology and the lessons learned from the sudden occurrence of the COVID–19 Pandemic, where in most cases only workers from the senior cadres and those on essential services were asked to go to work, has increased the awareness and the call for flexible work schedules globally. While the process has not received the required attention in Nigeria, it has been largely implemented with about 40% of the total work force in Canada. It is against this backdrop that this paper employs secondary source of information, with theoretical framework anchored on Expectancy Theory of motivation, to examine the issues in discourse. Findings revealed that the adoption of the Canadian pattern of Flexible Work Schedules with proper planning could increase productivity, bring about job satisfaction, enhance workers' performance, reduce overtime costs, as well improves the quality of life of the employees in Nigeria. It is therefore recommended amongst other things, that Nigeria should learn from the Canadian experience, achievable through the provision of adequate facilities required for the process, as well as organizing training for workers for its implementation.

Keywords: Flexible Work Schedules, Covid-19 Pandemic, Workers' Performance, Nigerian Experience, Canadian Experience

Introduction

The adoption of flexible work schedules, where workers are allowed to work from home; stands to be one of the most important options in addressing state emergencies, usually being declared by the government during or after natural disasters, civil unrest and medical pandemic. Since the emergence of the COVID-19 pandemic, there seems to be more awareness and increased demand for workplace flexibility globally. In Canada for example, the rate of work from home (WFH) in April 2020 increased to 39% of total labour force, compared with 4% in 2016 (Statistics Canada, 2021). This does not change much during the post COVID-19 era, as 23% of Canadian workers still work from home (Statistics Canada, 2021).

As indicated above, while there is increased desire and pragmatic approach by Canada to adopt flexible work schedules where applicable. The situation in Nigeria is quite different, perhaps due to the low level of knowledge and lack of facilities required for the process. For instance, instead of implementing flexible work schedules during the COVID-19 era, the Nigerian government introduced general lockdown aided by restriction of movement and social distancing, with only staff from the senior cadre and those on essential services being allowed to go to work, while others were asked to stay at home (NCDC, 2020). Also, during the post COVID-19 era, the Nigerian government refused to create any form of flexibility for workers, a situation that could generate low performance within both the private and public sector.

Unfortunately, these problems still exist in the era of high level of technological advancement, where Information Technology (ICT) is central to productivity. Since the advent of the 21st century, technological advancement has reached beyond expectations. There are frequent changes adopted through the introductionof Information Technology (ICT) in virtually every facet of production process. Work has now become easy and cheap because ICT can now be used in offices, schools, markets, hotels, hospitals, banks and even at home (Basahuwa, Unegbu & Babalola, 2020). Basahuwa, Unegbu & Babalola (2020) further noted that the adoption of ICT in Nigeria will not just make the work easy but flexible as well, such that through ICT, the employees can perform certain duties at home, works which are normally done in their various places of work. It is against this backdrop that this study attempts to compare the nature of work flexibility in Nigeria and Canada during the post COVID-19 era, with the hope of learning from the Canadian experience, towards achieving effectiveness in Nigeria.

Flexible Work Schedules: A Brief Conceptual Analysis

Flexible work schedules have been defined by scholars in various ways. These definitions vary according to the type and nature of the arrangement, as there are various names used in the arrangements process. The common forms of these arrangements according to Klindzic & Marić (2019) include flextime, compressed work arrangement, time swaps, telework and Split shifts. While Flextime involves an arrangement to work within some hours as agreed upon by the employer and employee; compressed work arrangement involves working for longer periods per day in exchange for a day off. Time swaps on the other hand refers to an arrangement where an employee requests time off for a certain number of days with the hope of working longer than usual hours on another day. Telework refers to working at home through the adoption of Information Technology (ICT). And finally, split shift encompasses working more in a given periods of time in order to stay off from work in another period.

The above definitions by implication, suggest the meaning of flexible work schedules. As noted by Austin-Egole, Iheriohanma & Nwokorie (2020), flexible work schedules refer to any form of practices that permit employees to decide their work schedules based on the agreement by the employer. It is a condition where the employee is permitted to have some control, particularly as regard to time and place of work. The above definitions by implication portray that the adoption of flexible work schedules requires an arrangement between an employer and an employee to plan the work schedules flexibly for the benefit of both parties. During this process, the employee could derive more job satisfaction, thereby improving his performance for the general growth of the organization.

Theoretical Framework

The study adopts the Expectancy Theory of motivation as theoretical framework.

The theory was proposed by Victor Vroom, a Psychologist at Yale School of Management in 1964. The theory states that the intensity of a tendency to perform in a particular manner is dependent on the intensity of an expectation that the performance will be followed by a definite outcome and on the appeal of the outcome to the individual (Vroom, 1964). This implies that people will be motivated based on organizational decision, particularly the decisions of the employer. In application, it is important to note that through motivation, the employer will be assured of getting better outcomes from the employees. This could also mean that, through motivational programs such as flexible work schedules in the workplace, employees will be motivated to work more.

The limit to the application of this theory is that incentives do not motivate all to improve performance, as some employees may take advantage of the process to remain ineffective, thereby leading to poor performance of the organization. However, the theory's relevance is assured by the importance of motivation to flexi-time workers, which cannot be underemphasized. It is important to note that, as obtainable in Canada, employees in Nigeria may require various kinds of motivations, including the adoption of flexible work schedulesto improve their performance. Flexible work schedules were adopted in Canada, particularly in the form of statutory holidays, annual vacations, as well as various types of statutory leave (EWDL, 2016).

Flexible Work Schedules in Post COVID-19 Era in Canada

Globally, before the emergence of COVID-19, flexible work schedule is relatively new. In Canada for example, the Canadian rate of work from home (WFH) in April 2020 increased to 39 percent of the total labour force, compared with 4 percent in 2016 (Statistics Canada, 2021). The situation does not change much during the post COVID-19 era, as 23 percent of Canadian workers still work from home (Statistics Canada, 2021). This was in compliance with the Canadian Government's decision to give workers in federally regulated sectors the right to formally request flexible work arrangements during and after the COVID-19 Pandemic (Government of Canada, 2020).

Part of the regulations include the decision by Canadian government in 2022 to introduce a model, aimed at providing overarching principles, steps to follow and key considerations for organizations, managersand employees when implementing a hybrid approach to work. This model specifically targeted the public sector, looks to afford a clearer outline for both managers and employees alike as to how to successfully institute a hybrid work model (Government of Canada, 2022). This guidance according to Champagne, Choiniere & Granja (2023) came into effect in early 2022. Champagne, Choiniere & Granja (2023) further noted that this hybrid model is aimed at overcoming the challenges emanated from the emergence of COVID-19 pandemic, which has continued to evolve since 2020 showcasing the different modalities that need to be considered to regulate teleworking, especially with reference to hybrid work models.

Although the Canadian Government's Directive on Telework came into effect on April 1, 2020 to address the problems initiated by the emergence of COVID-19 pandemic (Government of Canada, 2020; Dehghani, Omidi, Yousefinejad and Taheri, 2020);however, the new directive outlined more intently the purpose and utility of teleworking within the public

sector. Its results highlight the benefits that teleworking can provide to public employees, specifically, a reduction in stress, more flexibility and inclusion, as well as a reduction in transportation costs and pollution (Government of Canada, 2022).

Previously, before COVID-19, as captured by EWDL (2016), these regulations existed, but its awareness and use increased during and after the pandemic. The resort to these regulations increased the Canadian rate of work from home to about 40 percent of employees in April 2020, compared to four percent in 2016 and 23 percent in August 2021 (Statistics Canada, 2021).

Importantly, the quest for increased awareness and desire to adopt flexible work schedules in Canada can reduce employee's absenteeism; increases job retention rates and reduce demand for healthcare across Canada (EWDL, 2016). It is in view of these that the Canada Labour Code stipulates the need to improve labour laws that will encourage employers and individual employees to negotiate and devise flexible work arrangements that are tailored to their specific needs (EWDL, 2016). This is also done to maximize job satisfaction of both the employer and the employees (Lowe, 2020).As noted by Lowe, Hughes & Gilbert (2023), through flexible work schedules in Canada, home-based workers were satisfied or very satisfied with the respect they received from coworkers, independence, how they carry out their work, job security, work family balance, and doing meaningful work.

COVID-19 Pandemic and Flexible Work Schedules in Nigeria

The sudden occurrence of COVID-19 in 2020 has generally led to lockdowns and restrictions on movement across the world. As an unexpected and rapid spreading event, event, both the less developed and developing nations like Nigeria have little capacity to swiftly respond to the crisis. The crisis started on February 27, 2020 in Nigeria, with the first confirmed case in Lagos State. In that case, an Italian citizen who works in Nigeria had returned on February 25 from Milan through the Murtala Muhammed International Airport, fell ill on February 26 and was transferred to Lagos State Bio-security Facilities for isolation and testing (NCDC, 2020). This case led to the first phase of lockdown which was announced by President Mohammadu Buhari on April 27, 2020, with effect from May 4 to 17, spanning two weeks in Federal Capital Territory (FCT), Lagos and Abuja (NCDC, 2020).

To curb the spread of the pandemic, restriction of movement and the need for social distancing have been encouraged (NCDC, 2020). The government also allowed only civil servants from the senior cadre and those on essential service to go to work

while others were asked to stay at home (NDDC, 2020). This situation generated low productivity within the civil service and the entire private sector, a situation which created the continuing search fora means that will diversify the mode of production to increase productivity. As at then, there was no better option by the government or any bureaucratic organization in this case than to adopt Flexible Work Schedules to deal with such an outbreak.

Following this decision, corporate organizations in the country have no option but to obey government instruction, particularly as regards to restriction of movement (lockdown) and physical distancing. These led to a sharp reduction in physical work schedules and the need of redesigning flexible work schedules in the country. Generally, flexible work schedule seemed to be a strange experience for most people in developing economies. But the dramatic experience of the emergence of COVID-19 in Nigeria has changed the situation.

It's important to note that, while flexible work schedule was adopted during the COVID-19 era in Nigeria, it immediately came to an end after the Pandemic. By implication, it was discovered that, the period after COVID-19 pandemic witnessed poor observation of flexible work schedules, as the Federal government of Nigeria instructed all workers to be physically present at work. It was expected that COVID-19, which had led to increased awareness of work flexibility, should also influence government decisions. However, the government of Nigeria through the Nigerian Civil Service prefers workers to be physically present at work rather than resort to Flexible Work Schedules, which could generate low performance within both the private and public sector.Thus, flexible work schedules which became relevant in Nigeria during the COVID-19 era, continues to hold significance in the post-COVID-19 period.

The culture of working from home, which emerged due to lockdowns, has undoubtedly transformed many practices and activities for numerous individuals and organizations across the world. Interestingly, even in the absence of the COVID-19 pandemic, flexible work schedules had become pertinent, largely due to significant advancements in technology. It is well-known that information and communication technology (ICT) has replaced many manual processes and has become a fundamental component of productivity in the 21st century.

Although there are jobs that still require manual applications, but on a general note, through ICT work has now become both easier and cheaper (Basahuwa, Unegbu, & Babalola, 2020). It is now possible for an employee who spent 8 hours (8 am-4 pm) a day to do a job manually, to do the

same job in two hours through the use of ICT. If the work is ICT inclined, the adoption of flexible work schedules will enhance performance in such a way that the worker will be able to perform a job of four days in one day. In other words, the employee who is expected to remain in the office for eight hours (8 am-4 pm) can now spend two hours daily, having six more hours to spend on leisure, sleep and to attend to family and other issues. Or better still the employer may decide to add two hours to the worker such that the worker can do the job of 8 hours in two days by sharing it into four hours each. With this analysis, the increased adoption of flexible work schedules will be favourable to both public and private sector in Nigeria.

Canadian Experience and Lessons for Nigeria

The adoption of flexible work schedules in Canada was done at a time when there were quality tools required for the process, while the situation in Nigeria is characterized by poor training and insufficient tools.. In Nigeria, perhaps due to insufficient ICT tools and equipment, the increase of productivity through the adoption of Flexible work Schedules is difficult. By implication, the increase in the rate of adoption of Flexible Work Schedules in Nigeria will require high technology and expertise. Therefore, for effective and efficient utilisation of flexible work schedules, the Nigerian government and the organizations concerned must make a concerted effort to provide the employees with the requisite ICT tools, equipment and training for effectiveness. Nothing can be more frustrating to a skilled and enthusiastic worker than to know what to do and how to do it, but have no tools and equipment with which to carry out his or her work.

There is also the need to emphasize that, the Successful implementation of flexible work schedules in Canada was backed by adequate training of staff. Inadequate training of staff is a major obstacle facing the proper implementation of flexible work schedules in Nigeria. According to Afaq & Raja (2016), training and re-training of staff is required for the smooth implementation of flexible work schedules. In-service training courses for workers, most especially the junior cadres, to build their individual skills and competencies are essential within the organizations of government.

In addition, it is so glaring that the competence and attitudes of both the workers and supervisors have an important bearing on workers' performance (Pedersen & Lewis, 2012). Employees are usually drawn from the universities, the research centres and the entire school system; as such the need to perform excellently is expected to be un-debatable. This was the case in Canada. But in Nigeria, it is unfortunate that several employees,

particularly at the lower cadres do exhibit incompetency and laziness towards work. On the other hand, most supervisors do not have the capacity to motivate and provide opportunity to the worker to become an expert on a particular task (Dahlstrom, 2013). It is therefore not possible to adopt flexible work schedules where there is no capacity to deliver efficient services, a situation which could generate low productivity despite latest technology and trained manpower.

The challenge of negotiations between the employer and the employee on the wages, location and time of work is another serious problem in Nigeria. This was not the case in Canada. In Nigeria, the negotiation between the federal government and the Nigeria Labour Congress used to be very tense, characterized majorly by strikes, riots and protests. The problem is that, most organizations require the physical presence of the worker, and if Flexible Work Schedules are to be adopted, there should be a reduction in wages of workers due to the fact that the worker may be less committed to the organization (Klindzic & Marić, 2019). This is so challenging because such organizations will not like to entertain any arrangement for workplace flexibility. The introduction of Flexible Work Schedules in such organizations should be carefully done to avoid a tendency of a decreasing productivity.

Importantly, while the overall benefits of workplace flexibility are clearly known in Canada, its benefits in Nigeria seem to be vague. This was captured in the opinion of Galea, Houkes & De Rijk (2013), who noted that the impacts of flexible working hours on work-life balance have been vague and seem to favour the organization more than the employee. In their opinion, Pedersen & Lewis (2012) posits that, even though flexible Work Schedules give freedom and control to structure work and personal life, preserving the boundaries between these two might be challenging. It may be true that Flexible Work Schedules could result in the loss of direct control over employee work patterns and drop in commitment or discipline of workers, but in spite of all these, Flexible Work Schedules is therefore proved durable with clear advantages when properly implemented and well managed. The governments of Nigeria are still unwilling to expand the limit of flexible arrangements beyond a certain point for fear of low productivity (Galea, Houkes & De Rijk, 2013). This is a call for more research to outline the tangible benefits of extending flexible work Schedules in Nigeria.

Finally, it is no longer new that ICT has since replaced some manual processes, and this is fundamental to productivity in the 21st century. This was the case in Canada. Although there are jobs that still requires manual applications globally, on a general note, working through ICT has now become both

easier and cheaper. For instance, it is now possible for workers who spend 8 hours (8 am-4 pm) a day to do a job manually, to do the same job in 2 hours through the use of ICT. If the work is ICT inclined, the adoption of Flexible Work Schedules will enhance performance, such that the worker will be able to perform a job of four days in one day. In other words, the Civil Servant who is expected to remain in the office for eight hours (8am-4pm) can now spend 2 hours daily, having 6 more hours to spend on leisure, sleep and to attend to family and other issues. Or better still the employer may decide to add 2 hours to the worker such that the worker can do the job of 8 hours in two days by sharing 4 hours each. With this analysis, the increased adoption of Flexible Work Schedules, as obtainable in Canada will be favourable to the Nigeria Civil Service.

Conclusion

Although flexible work schedules have proved durable with clear advantages when properly implemented and well managed; it may be difficult to adopt them in Nigeria because their benefits are still not clearly defined. This is due to several challenges, among which are the challenge of negotiations between the employer and the employee on the wages, location and time of work in Nigeria. Another problem is the challenge of adequate laws regarding the implementation of flexible work schedules in Nigeria. This perhaps is because there are no adequate laws in Nigeria on the implementation of the process. The case of Canada, which is characterized by the presence Canadian labour code, adequate, tools, advanced technology, and relations between employers and employees seems to be different. This is in sharp contrast with Nigeria.This is in sharp contrast with Nigeria situation. As such, most organizations require the physical presence of the worker and do not like to entertain any arrangement for workplace flexibility. As such, if by any means applicable, the introduction of flexible work schedules should be carefully done to avoid a tendency of a decreasing productivity. ,

Recommendations

The study recommends among other things that:

1. The Nigerian government should learn from the Canadian government by incorporating citizens right to request flexible work arrangements in their labour laws. This statutory right should entitle employees to formally request for flexible work schedules on a temporary or permanent basis.
2. There is need to increase the adoption of flexible work schedules in Nigeria, given the growing trend of technology couple with the lesson of COVID-19 Pandemic. This is achievable through ICT digitalization process for its effective implementation.
3. To pave way for proper implementation of flexible work

schedules in Nigeria, the Nigeria government should redesign services and deliver them digitally in this 21st century through provision of adequate facilities and organizing training and re-training of staff.

4. Public and private employees should equip themselves for a flexible work arrangement by acquiring more skills needed for the process. Apart from the trainings and workshops organized by the government, each and every employee should enroll for training on flexible work schedules in order to equip themselves for the process.

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Teachers and Students' Technology Appropriation for Classroom Engagements in Selected Public Schools in Akinyele Local Government Area of Oyo State

By

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Abstract

The study examined critical discourse on teachers and students' technology appropriation for classroom engagements (TACE). *The study employed descriptive research design while population comprised all public teachers and students in Akinyele Local Government Area of Oyo State, Nigeria. Purposive sampling technique was used to select the participants (300 Students and 60 Teachers) from schools with constant supply of computing facilities. Four scales titled Awareness of TACE (r= 0.98), knowledge of TACE (r= 0.71), perception TACE (r= 0.73), and readiness TACE (r= 0.85) were used in data collection. It was discovered that both the teachers and students were aware of technology/digital tools for classroom engagement, but teachers were not deploying the equipments provided and other online tools. Both had average knowledge of TACE. It was further found that the students were ready for the experience but curtailed by teacher factors and other logistics beyond their capacity. Both the teachers and students had positive perception of technology appropriation for classroom engagements. Result also showed that while students are ready for TACE, teachers are not completely ready. It is recommended that teachers should be encouraged to appropriate teaching and learning technologies for classroom engagement.*

Keywords: Classroom, Technology, Appropriation, Experience, Schools

Introduction

Technology has emerged as a central force shaping modern education, creating new avenues for teaching, learning, and communication in ways unimaginable in previous centuries. It has radically transformed the landscape of teaching and learning, particularly in the past few decades (Eze & Chukwuemeka, 2021). Thus, from

interactive whiteboards to Learning Management Systems (LMS) like Moodle or Google Classroom, to communication platforms like Zoom and Microsoft Teams, technology has opened new possibilities for pedagogical innovation (Ertmer et al., 2021). These manifestations of technology in the education sector have led to various changes in the way teachers teach, and students learn. For instance, technologies such as tablets, digital learning applications, and educational games have been integrated to promote interactive and collaborative learning in some classroom in developed countries such as United Kingdom, United States of America and some other Scandinavian countries like Denmark, Norway, Sweden among others.

Technology appropriation is a process through which there is adaptation, assimilation, and integration of new technologies into specific contexts, cultures, and practices (Akinbode and Oladipo, 2023). It is to be noted that appropriation goes beyond mere adoption, it involves an evolving process where users redefine the use of technology to fit their professional and personal needs, creating an interactive relationship between technology and its users. The notion of technology appropriation, rooted in sociocultural theory, suggests that technology is not a neutral tool but is embedded with values, cultural meanings, and social practices (Oyebode & Afolabi, 2020). The manifestations of technology appropriation in teaching and learning are also evident in the shift towards digital content creation (Molnar, 2022). Instead of relying on static textbooks, teachers and students can now access a wealth of online resources, multimedia content, and open educational resources (OERs), fostering more diverse and inclusive learning environments (Hsu & Ching, 2023).

In teaching and learning, there is the selection and use of technological tools and platforms that align with teaching objectives, student learning needs, and the overall institutional framework. Therefore, technology appropriation in the classroom is an evolving and dynamic process influenced by pedagogy, policy, and practice (Ertmer, et al., 2021). As technologies are integrated into teaching and learning contexts, the processes of negotiation, interpretation, and personalization take place. Hence, it is believed that teachers and students must interpret how to use these technologies. That is, they are expected to often transform them to suit unique instructional and learning needs (Molnar, 2022). However, in doing this, the process varies depending on context, as both individual and collective factors such as access, skill level, institutional support, and perceived benefits are likely to influence the way technology is appropriated.

Technological appropriation,

particularly in teaching and learning, is not a straightforward task. It requires technical infrastructure, digital literacy, and cultural readiness (Ogunlade & Akinbode, 2022). For instance, the proliferation of Massive Open Online Courses (MOOCs) has provided opportunities for learners worldwide to gain knowledge and skills, breaking down geographical and economic barriers. However, the manifestation of technology appropriation in teaching and learning is not without its challenges. Thus, issues such as digital divide, lack of adequate teacher training, resistance to change, and unequal access to technological resources among others persist (Omotayo & Ogunyemi, 2020). In many cases, while technology is present in schools, its potential is not fully realized due to inadequate integrationstrategies, poor infrastructure, and low levels of digital literacy among teachers and students (Afolabi & Olowookere, 2020). Thus, there is a critical need to understand how technology is appropriated in classrooms, particularly from the perspectives of the key stakeholders, who are teachers and students (Ogunlade & Akinbode, 2022).

It is to be noted that global best practices for technology-enhanced teaching and learning emphasise the integration of technology in ways that support pedagogy, promote engagement, and improve student outcomes (Adeoye & Olofinsoye, 2022). Thus, a successful technology appropriation in teaching and learning involves more than the availability of devices or digital tools; it apparently requires effective instructional design, thoughtful integration into curriculum, and ongoing professional development for teachers (Al-Abdulkareem, 2022).

According to Eze and Chukwuemeka (2021), one of the best practices globally is the use of blended learning models, where face-to-face instruction is combined with online learning. This approach allows for flexibility and personalised learning, as students can access course materials at their own pace and teachers can utilise a variety of online resources to complement traditional teaching methods (Ertmer, Ottenbreit-Leftwich & Tondeur, 2021).

It is to be noted that tertiary institutions like Stanford University, the University of Edinburgh, the University of Ibadan and the Open University are pioneers in adopting blended learning models that have transformed teaching and learning practices. Literature is replete with the fact that global best practice in technology appropriation manifests in the use of data-driven instruction, where teachers leverage student data from digital tools and platforms to inform their instructional decisions (Aydin, & Gumus, 2020). Hence, educational technologies like adaptive learning systems, which tailor content to individual learner's needs, are increasingly being used in classrooms

worldwide. This has critical implication for the world of teaching and learning. That is, it will help in getting and analysing real-time data on student academic performance as teachers can provide personalised feedback and targeted interventions, leading to better learning outcomes. There is also, the place of collaborative approach to teaching and learning through technology is also a widely recognised best practice (Dada & Adeyemi, 2022).

There are platforms that facilitate real-time communication and collaboration, such as Google Docs, Microsoft OneNote, and Slack, that allows students to work together on projects regardless of physical location (Ojo & Ogunseye, 2021). This fosters the development of collaborative skills, which are essential in the modern workforce. In addition, global best practices lay emphasis on the importance of teacher professional development in the use of educational technologies. Thus, continuous training and support are crucial to ensure that teachers are not only proficient in using technological tools but are also equipped with pedagogical strategies to integrate these tools effectively into their teaching. In this study, for crucial variables are assessed out of several concerns. This is due to the rudiments required for effective usage. These variables are teachers and students' awareness, knowledge, perception and readiness of t echnology appropriation for classroom engagement.

Firstly, awareness refers to the recognition and understanding of available technological tools that can be applied in educational settings (Al-abdulkareem, 2022). By implication, it is the understanding of the availability of technological tools, the potential benefits they offer, and the ways they can be integrated into teaching and learning activities. Thus, aawareness of technology appropriation among teachers and students is a critical factor in the successful integration of technology into educational settings (Hsu & Ching, 2023). In this study, it relates to the extent to which teachers and students are conscious of the existence of educational technologies (Ganascia, 2020). This includes tools such as smartboards, learning management systems (LMS), and educational apps. Teachers who are aware of the latest technological trends and tools are better positioned to make informed decisions about which technologies to integrate into their classrooms.

It is worthy of note that, awareness does not always translate into action, as teachers may still face barriers such as lack of access to resources, insufficient training, or institutional constraints. For teachers, awareness is closely linked to exposure to technology through professional development programs, educational conferences,

and collaboration with colleagues (Ojo, & Iroegbu, 2023). Students' awareness of technology appropriation often depends on their exposure to digital tools in their personal lives and in the classroom (Carrillo & Flores, 2020). While many students are familiar with basic technologies such as smartphones, social media platforms, and search engines, they may not be fully aware of the range of digital tools available for academic purposes. Increasing students' awareness of how technology can support their learning is essential for fostering effective technology use in teaching and learning context (Ganascia, 2020). It encompasses both teachers' and students' familiarity with various digital resources, devices, and platforms that facilitate teaching and learning (Ertmer et. al., 2021). For instance, teachers may be aware of an LMS like Google Classroom but may not fully understand its potential beyond basic functions, while students might know how to access resources online but not how to effectively use them for learning.

Another variable of concern in this study is knowledge of technology appropriation for classroom engagement. Knowledge is the depth of understanding and ability to use technology effectively in the classroom (Adeoye & Olofinsoye, 2022). It includes both technical proficiency and the pedagogical application of these tools. In this study, teachers' average knowledge highlights that many can operate basic technologies but may lack the skills to integrate them into their teaching strategies. For students, it is to be noted that high knowledge reflects their comfort with digital tools but often without critical application, such as using technology to solve complex problems or enhance learning outcomes. The knowledge of technology appropriation varies widely among teachers and students, shaped by factors such as experience, exposure, training, and institutional support. For teachers, knowledge of technology appropriation involves understanding both the functionality of digital tools and their pedagogical applications (Carrillo & Flores, 2020).

It is not enough to know how to operate an interactive whiteboard or navigate an LMS; teachers must also grasp how these tools can be used to enhance teaching and learning processes (Baran & AlZoubi, 2021). Teachers who possess strong knowledge of technology appropriation can design lessons that integrate digital resources in meaningful ways, fostering critical thinking and engagement among students (Oyebode & Afolabi, 2020). By implication, they are capable of curating digital content, creating interactive learning experiences, and using student data to inform instruction. However, many teachers, particularly in regions with limited access to professional development opportunities, may lack this level of

expertise, resulting in underutilization or ineffective use of technology. This is because students' knowledge of technology appropriation is also critical, as they must navigate digital tools to access information, collaborate with peers, and complete assignments.

In today's world, while many students today are "digital natives," familiar with the use of technology in their daily lives, this does not automatically translate into effective use in academic contexts (Ojo & Ogunseye, 2021). This is because students need guidance on how to use digital tools for learning, including information literacy, digital citizenship, and the ability to critically assess online resources. The knowledge of technology appropriation among both teachers and students is therefore a key determinant of the success of technology appropriation or integration in the classroom. This is so because without adequate knowledge, technology may remain a superficial addition rather than a transformative tool for teaching and learning.

Perception plays a crucial role in the appropriation of technology in education. It refers to the attitudes and beliefs held by teachers and students about the use of technology in education (Baran & AlZoubi, 2021).

This includes how they view its benefits, limitations, and overall role in enhancing learning. In this study, teachers' positive perception of technology signifies their belief in its potential to improve engagement and teachingefficiency (Eze & Chukwuemeka, 2021). Students, on the other hand, perceive technology as a tool that makes learning more flexible and interactive, although they may sometimes view it as a convenience rather than a learning enhancer. Teachers' and students' attitudes towards technology can either facilitate or hinder its integration into the classroom (Ertmer et. al., 2021). It is affirmed by Dada and Adeyemi (2022) that teachers who perceive technology as a valuable tool for enhancing pedagogy are more likely to integrate it into their teaching practices, while those who view it as an additional burden or as irrelevant to their teaching may resist its use.

Studies from Carrillo and Flores (2020) have shown that teachers' perceptions of technology are shaped by their personal experiences with digital tools, their confidence in using them, and the level of support they receive from their institutions. This is so because teachers who have positive experiences with technology are more likely to see it as beneficial and are thus more motivated to explore its potential in the classroom (Ganascia, 2020). Conversely, those who have encountered technical difficulties, lack of institutional support, or insufficient training may develop negative perceptions, leading to reluctance in adopting technology.

Similarly, students' perceptions of technology influence their willingness to engage with it in the classroom. Students who see technology as enhancing their learning experience are more likely to embrace its use, while those who perceive it as unnecessary or distracting may disengage. According to Molnar (2022), students' perceptions are often influenced by the way technology is used in the classroom whether it supports active, student-centred learning or merely serves as a passive tool for content delivery.

Another variable of note is readiness for technology appropriation for classroom engagement. It refers to the preparedness of teachers and students to effectively integrate and use technology in the classroom (Oyebode & Afolabi, 2020). Readiness refers to the preparedness and willingness of teachers and students to integrate technology into teaching and learning activities (Omotayo & Ogunyemi, 2020). It includes access to resources, technical skills, and motivation to use technology effectively. In this study, teachers' readiness is often constrained by insufficient training, support, or infrastructure, even if they are motivated to use technology. Conversely, students are generally more ready, given their regular interaction with digital tools in their daily lives, but this readiness may not always translate into effective educational use without proper guidance. This includes not only technical skills but also the mindset, infrastructure, and support systems necessary for successful technology appropriation. For teachers, readiness is shaped by factors such as digital literacy, professional development, and access to resources. The increasing appropriation of technology into the teaching and learning has sparked a shift in the way it is being conducted. This is because technological advancements hold tremendous potential to enhance learning outcomes. However, the effective appropriation of these tools by teachers and students remains a significant challenge. Despite the growing availability of digital platforms, resources, and tools designed to facilitate learning, there is a widespread gap between the presence of technology in classrooms and its meaningful use to improve instruction and student engagement. This gap is particularly concerning as it affects both the quality of education and the development of 21st-century skills that students need to thrive in a digital world. Teachers and students are expected to navigate a rapidly evolving educational landscape, where digital literacy, technological proficiency, and the ability to integrate digital tools into pedagogical practices are paramount. However, evidence suggests that many teachers lack the knowledge, skills, and support necessary to effectively appropriate technology in their classrooms. This issue is exacerbated by inconsistent access to professional

development, insufficient infrastructure, and resistance to change. Consequently, technology is often underutilized or used in ways that do not significantly enhance teaching and learning. Teachers may resort to using technology as a substitute for traditional methods, rather than leveraging its potential to create interactive, student-centered learning environments.

Similarly, students, despite being regarded as "digital natives," often struggle to use technology in academic contexts. While they may be adept at using social media or personal devices, many lack the awareness and skills needed to apply these technologies to learning activities. This raises concerns about their ability to engage with digital tools meaningfully and critically in a classroom setting. In some cases, students may even perceive technology as a distraction rather than a tool for enhancing their learning experience, further limiting its potential impact. Moreover, the perceptions and attitudes of both teachers and students toward technology appropriation play a crucial role in determining the success of its integration. Teachers who view technology as a burden or an additional task are less likely to adopt it in transformative ways. Also, students who see technology as irrelevant or merely a convenience may not engage with it deeply, limiting its educational benefits. There is a need for a deeper understanding of how both teachers and students perceive, experience, and engage with technology in the classroom, as these perceptions directly influence its effectiveness. Hence, this study did an assessment of teachers' and students' technology appropriation for classroom engagements in selected public schools in Akinyele Local Government Area of Oyo State

Research Objectives

Generally, the study assessed teachers' and students' classroom technology appropriation experience in Akinyele local government area of Oyo state. Specifically, the objectives are to;

i. Assess the level of teachers' and students' knowledge of technology appropriation for classroom engagements
ii. Ascertain the level of teachers' and students' awareness of technology appropriation for classroom engagements
iii. Examine the level of teachers' and students' perception of technology appropriation for classroom engagements
iv. Assess the level of teachers' and students' readiness for technology appropriation for classroom engagements.

Materials and Methods

This study employed a descriptive research design A validated self-designed instruments having four sections was administered to selected teachers and students across various schools in Akinyele Local Government

Area of Oyo State to gather quantitative data on their awareness (r= 0.98), knowledge (r= 0.71), perceptions (r= 0.73), and readiness (r= 0.85) for technology appropriation for classroom engagement. The sample was selected through a combination of purposive and random sampling to ensure a representative mix of schools with varying levels of technological infrastructure. Quantitative data were analyzed using descriptive statistics.

Research Question 1: What is the level of teachers' and students' knowledge of Technology Appropriation for Classroom Engagements?

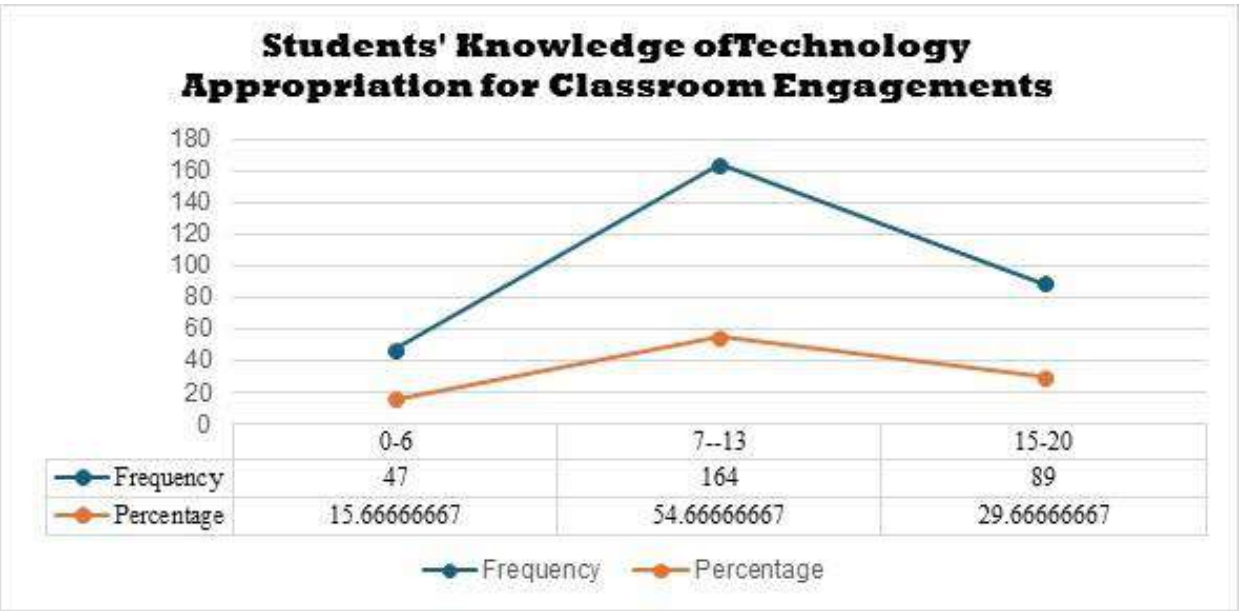

Fig. 1: Students' Knowledge of Technology Appropriation for Classroom Engagements

Figure 1 shows the range of scores of students' knowledge level of technology appropriation for classroomengagement tests administered on them. The figure indicates that 47 (15.7%) of the students had low level of knowledge level of technology appropriation for classroom engagement, 164 (54.7%) had average level while only 89 (29.7%) had high level. The mean score of the students had average technology appropriationfor classroom engagement.

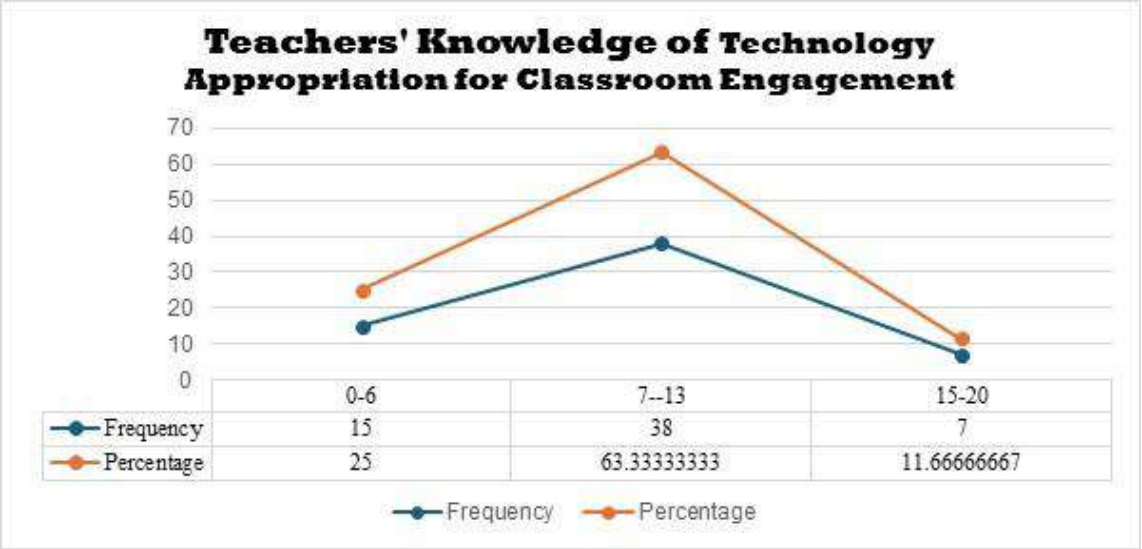

Fig. 2: Teachers and Students' Knowledge of Technology Appropriation for Classroom Engagements

Figure 2 shows the range of scores of teachers' level of technology appropriationfor classroom engagement tests administered on them. The figure indicates that 15 (25%) of the teachers had low level of knowledge level of technology appropriationfor classroom engagement, 38 (63.2%) had average level while only 7 (11.7%) had high level. The mean score of the teachers had average knowledge of technology appropriationfor classroom engagement.

Research Question 2: What is the level of teachers and students' awareness of technology appropriation for classroom engagements?

Table 1: Mean Responses of Teachers and Students' Awareness of Technology Appropriation for Classroom Engagements

S/N	Item	Teachers (M)	Teachers (SD)	Students (M)	Students (SD)
1	I am aware of the various digital tools available for enhancing classroom learning (e.g., online platforms, interactive whiteboards).	3.28	.715	3.31	.476
2	I understand how to use technology effectively to engage students during lessons.	3.42	.619	3.25	.480
3	I feel confident incorporating new technology into my teaching/learning practices.	2.13	1.065	3.27	.622
4	I believe that using technology in the classroom enhances student participation and engagement.	3.12	.761	3.08	.680
5	I am comfortable with troubleshooting basic technical issues that arise during class.	2.65	1.022	3.13	.641
6	I am aware of how technology can be used to promote collaboration among students.	3.27	.634	3.13	.651
7	I regularly seek out new technology to improve classroom instruction and learning.	3.37	.610	3.15	.837
8	I understand the ethical considerations related to using technology in the classroom, such as privacy and data protection.	2.43	.927	3.09	.767
9	I am aware of the potential distractions technology can introduce into the learning environment and know how to manage them.	2.50	1.000	3.17	.738
10	I understand how to use technology to provide personalized learning experiences for students, adapting to different learning styles.	3.02	.948	3.17	.692

Weighted Average: Teachers: 2.92 Students: 3.18

Table 1 shows the responses of the level of students' awareness of technology appropriation for classroom engagement. It reveals a weighted average of 2.65 which is higher than the threshold of 2.5. This implies that the students' awareness of technology appropriation for classroom engagement was high.

Table 4.3 shows the responses of the level of teachers' awareness of technology appropriation for classroom engagement. It reveals a weighted average of 2.92 which is higher than the threshold of 2.5. This implies that the teachers' awareness of technology appropriation for classroom engagement was high.

Research Question 3: What is the level of teachers and students' perception of technology appropriation for classroom engagements?

Table 2: Mean Responses of Teachers and Students' Perception of Technology Appropriation for Classroom Engagements

S/N	Item	Teachers (M)	Teachers (SD)	Students (M)	Students (SD)
1	I believe technology makes learning more engaging and interactive in the classroom.	3.27	.634	3.29	.517
2	Technology helps me better understand complex topics during lessons.	3.37	.637	3.25	.573
3	I feel that using technology in the classroom enhances my ability to collaborate with others.	2.57	1.015	3.31	.639
4	Technology helps improve communication between teachers and students in the classroom.	2.70	.869	3.10	.704
5	I perceive technology as a valuable tool for increasing student participation and interest.	3.10	.796	3.07	.798
6	The use of technology makes it easier to track and assess learning progress.	3.15	.732	3.11	.779
7	I believe that technology allows for more creative and innovative teaching/learning methods.	3.17	.693	3.09	.838
8	I feel more motivated to engage in classroom activities when technology is integrated.	2.42	.869	3.05	.857
9	Technology helps bridge the gap between theoretical knowledge and real-world applications.	2.72	.846	3.28	.819
10	I perceive the use of technology as essential for preparing students for future careers and societal demands.	3.27	.756	3.23	.714

Weighted Average: Teachers: 2.97 Students: 3.18

Table 2 shows the responses of the level of students' perception of technology appropriationfor classroom engagement. It reveals a weighted average of 3.18 which is higher than the threshold of 2.5. This implies that the students' perception of technology appropriationfor classroom engagement was high. Table 4.3 shows the responses of the level of teachers' perception of technology appropriation for classroom engagement. It reveals a weighted average of 2.97 which is higher than the threshold of 2.5. This implies that the teachers' perception of t echnology appropriation for classroom engagement was high.

Research Question 4: What is the level of teachers and students' readiness of Technology Appropriation for Classroom Engagements?

Table 3: Mean Response of Teachers and Students' Readiness for Technology Appropriation for Classroom Engagements

S/N	Item	Teachers (M)	Teachers (SD)	Students (M)	Students (SD)
1	I feel prepared to use technology effectively in the classroom to enhance learning.	2.88	.761	3.22	.774
2	I have received adequate training on how to integrate technology into my teaching/learning practices.	2.07	.861	3.36	.795
3	I am confident in my ability to adapt to new technological tools introduced in the classroom.	2.93	1.006	2.30	1.029
4	I am ready to explore new ways of teaching/learning that involve technology.	2.70	1.124	2.92	.948
5	I feel comfortable using digital platforms and software for classroom activities.	1.98	.854	2.93	1.022
6	I am equipped with the necessary skills to troubleshoot and resolve common technical issues during lessons.	2.78	1.059	3.31	.763
7	I am prepared to incorporate technology into both in -person and online learning environments.	3.17	.717	3.28	.835
8	I am open to continuous learning and improvement regarding the use of technology in education.	2.50	.983	2.53	1.006
9	I have access to the required resources (e.g., devices, internet) to effectively use technology in the classroom.	2.50	1.050	2.48	1.089
10	I believe that my current level of technological competence is sufficient for engaging students in the classroom.	2.95	.790	2.86	1.096

Weighted Average: Teachers: 2.65 Students: 3.18

Table 3 shows the responses of the level of students' readiness for technology appropriationfor classroom engagement. It reveals a weighted average of 2.919 which is higher than the threshold of 2.5. This implies that the students' readiness for technology appropriation for classroom engagement was high. Table 4.3 shows the responses of the level of teachers' readiness for technology appropriation for classroom engagement. It reveals a weighted average of 2.65 which is higher than the threshold of 2.5. This implies that the teachers' readiness for technology appropriation for classroom engagement was high.

Discussion

The finding that teachers are aware of technology appropriate for classroom use highlights the increasing visibility and availability of educational technologies in modern schools. The finding is in line with that of Adeoye and Olofinsoye (2022) and Baran and AlZoubi, (2021) whose submission found that teachers are now being exposed to a wide range of digital tools and platforms designed to facilitate teaching and enhance student learning, such as interactive whiteboards, online learning management systems, and educational software (Carrillo & Flores, 2020) This awareness is often cultivated through professional development programs, institutional support, and the integration of technology into curricula. However, being aware of technology does not necessarily translate to effective use. While many teachers know about digital tools, the challenge often lies in selecting the most pedagogically suitable technologies for their specific teaching contexts. Awareness may also be skewed by disparities in access to training and resources, especially in under-resourced schools.

It is in line with that of Ertmer et. al.(2021) which affirmed that teacher awareness is a positive indicator, further exploration is needed to understand how this awareness translates into meaningful classroom integration and whether it leads to improved teaching practices. The finding that students are aware of technology appropriate for the classroom reflects the growing digitalization of education and the prevalence of technology in students' daily lives. Being "digital natives," students are often familiar with various digital tools, such as online learning platforms, educational apps, and collaborative tools, which are increasingly embedded in the educational experience. However, student awareness of technology does not necessarily imply that they are knowledgeable about its most effective use in academic settings. Molnar (2022) stated that awareness is often influenced by their exposure to technology at home, in school, or through social interactions, but there remains a gap between general familiarityand an in-depth understanding of how these tools can be optimized for learning. For instance, students may know how to navigate basic digital tools but struggle with critical aspects of technology use, such as information literacy or digital responsibility. Therefore, while awareness is a crucial first step, it should be paired with skills training to ensure s tudents can leverage technologytoenhance their educational experience effectively.

The finding that teachers possess average knowledge of technology appropriation for the classroom suggests that while teachers are aware of digital tools, their understanding of

how to integrate these technologies into pedagogyremains moderate (Ogunlade & Akinbode,, 2022) This is likely due to a combination of factors, including limited professional development, lack of institutional support, and varying levels of digital literacy among teachers. Average knowledge indicates that teachers may be familiar with using basic digital tools, such as projectors or PowerPoint, but may struggle with more sophisticated applications like flipped classrooms, personalized learning platforms, or data-driven instruction (Ojo & Iroegbu, 2023) This gap in knowledge can hinder the potential for technology to truly transform classroom experiences and enhance student engagement. Teachers need continuous training that focuses not only on technical skills but also on pedagogical strategies for incorporating technology meaningfully into instruction. Without addressing this gap, technology may continue to be underutilized, limiting its impact on teaching and learning.

The finding that students had high knowledge of technology appropriation for the classroom reflects their comfort and familiarity with using digital tools in learning environments (Adeoye & Olofinsoye 2022). Many students, especially in well-resourced schools, have grown up with technology and are proficient in using various platforms to complete assignments, collaborate with peers, and access educational content. High knowledge among students can be attributed to their frequent interaction with digital tools both inside and outside the classroom, as well as the increased emphasis on digital literacy in educational curricula. Al-abdulkareem (2022). This level of knowledge positions students to take full advantage of technology in enhancing their learning experiences. However, while students may have high knowledge of how to use digital tools, it is important to ensure that this knowledge is applied critically and responsibly. Eze and Chukwuemeka (2021) stated that students should be guided in using technology to develop skills such as problem-solving, collaboration, and critical thinking, rather than simply relying on technology for convenience or rote tasks.

The finding that teachers hold a positive perception of technology appropriation for the classroom is encouraging, as it suggests that many educators recognize the potential benefits of integrating digital tools into teaching Ganascia (2020). Teachers who view technology favorably are more likely to explore its use in enhancing student engagement, facilitating differentiated instruction, and promoting collaborative learning environments. Positive perceptions are often shaped by personal experiences with technology, successful classroom implementations, and institutional support that provides the necessary

resources and training. However, while positive attitudes are critical for encouraging technology use, they must be paired with adequate knowledge, support, and infrastructure to ensure that these tools are used effectively (Ertmer et. al., 2021). A positive perception alone cannot overcome the challenges of limited resources, lack of technical support, or inadequate professional development. Therefore, fostering a positive outlook among teachers must be part of a broader strategy that addresses the practical aspects of technology integration in education.

Students' positive perception of technology appropriation for the classroom aligns with their familiarity and frequent use of digital tools in their daily lives (Eze & Chukwuemeka, 2021). Many students view technology as an integral part of their learning experience, particularly as it allows for more interactive, flexible, and personalized education (Hsu & Ching 2023). A positive perception can motivate students to engage more actively with digital platforms, collaborate with peers, and seek out additional learning resources. However, this positive attitude must be accompanied by proper guidance from educators to ensure that students use technology effectively and not simply for convenience or entertainment. While students may perceive technology as a means of making learning easier or more enjoyable, it is essential to ensure that their engagement with digital tools fosters deeper learning and critical thinking. Molnar (2022). Positive perceptions should therefore be supported by educational frameworks that promote responsible, reflective, and meaningful use of technology in academic contexts.

The finding that teachers are ready for technology appropriation in the classroom indicates a growing acceptance of digital tools as essential components of modern education (Ogunlade & Akinbode 2022) Teachers who are ready to integrate technology are likely to have the necessary mindset, skills, and access to resources that allow them to explore innovative teaching methods. Readiness implies not only a willingness to use technology but also a preparedness to undergo professional development and adapt teaching strategies to incorporate digital tools effectively (Ojo & Iroegbu 2023). However, readiness can be hindered by external factors such as lack of access to up-to-date technology, inadequate infrastructure, or insufficient institutional support. Therefore, while teachers may be personally ready and motivated to embrace technology, their readiness must be supported by systemic changes that address these barriers (Afolabi & Olowookere 2020). Ensuring that teachers have the resources, training, and ongoing support necessary to sustain technology integration is

critical to translating readiness into effective classroom practices.

Students' full readiness for technology appropriation in the classroom is reflective of their extensive exposure to digital tools and the increasing incorporation of technology into educational practices (Alabi & Akindele 2021). Many students are proficient in using various digital platforms for learning, from accessing online materials to engaging in collaborative activities. Their readiness is often driven by their ability to adapt quickly to new technologies and their preference for interactive and flexible learning experiences (Aydin & Gumus 2020). However, full readiness does not necessarily mean that students know how to use technology in the most effective or responsible ways. To harness students' readiness for technology, educators must provide structured guidance that helps students use digital tools for deeper learning and critical engagement (Ertmer et. al., 2021). Additionally, readiness can vary significantly depending on factors such as socioeconomic background and access to technology outside of school. Therefore, ensuring that all students are equally ready requires addressing these disparities and providing equitable access to digital resources.

Conclusion

The integration of technology into education has the potential to revolutionize teaching and learning by creating more dynamic, interactive, and personalized learning environments. However, the findings from this study revealed that while both teachers and students demonstrated awareness and r eadiness for technology appropriation in the classroom, significant gaps remain in terms of knowledge, perceptions, and practical implementation. Teachers are aware of various technological tools but often lack the depth of knowledge required for effective appropriation into pedagogy. Their perceptions are generally positive, which is a promising sign for future integration, but the existing barriers such as insufficient training.

Recommendations

I. Continuous training programmes should be offered to equip teachers with both the technical skills and the pedagogical strategies needed to effectively integrate technology into their teaching practices.
ii. Schools should invest in up-to-date technological infrastructure, including devices, software, and internet access, to ensure that both teachers and students have the necessary tools for effective technology appropriation.
iii. Schools should establish dedicated technology support teams that provide real-time assistance to teachers and students, ensuring smooth and efficient use of digital tools in classrooms.
iv. In addition to familiarity with

technology, students should receive instruction on how to use digital tools responsibly and effectively, with an emphasis on information literacy, digital citizenship, and critical thinking.

v. Teachers should be encouraged to use adaptive learning platforms that personalize instruction based on individual student needs, making learning more relevant and engaging for each student.

vi. Schools should promote the use of digital tools that facilitate collaboration among students, such as online discussion forums, shared documents, and virtual group projects, fostering essential skills for the modern workforce.

vii. Efforts should be made to ensure equal access to technology for all students, regardless of socioeconomic background, by providing devices, subsidized internet access, or technology lending programs where necessary.

viii. Schools should create a culture that celebrates and rewards innovative uses of technology, encouraging both teachers and students to experiment with new digital tools in creative ways.

ix. Schools should create and enforce comprehensive policies that guide the appropriate use of technology in classrooms, ensuring alignment with educational goals and the ethical use of digital tools.

x. Schools should implement mechanisms for evaluating the impact of technology on student outcomes, adjusting strategies based on feedback from teachers, students, and data on educational performance to continuously improve technology integration.

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Influence of Social Factors on the Participation of Female University Students in Extramural Sports.

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Abstract
Despite growing awareness of the significance of physical fitness and sports in education, female students often exhibit lower participation in sports compared to their male counterparts. This paper examined the influence of social factors on the participation of female university students in extramural sports. A descriptive survey research design was employed, focusing on all female students at universities from 19 public universities in Southwest Nigeria. The sample consisted of 496 female students selected through a multistage sampling procedure. Data were gathered through an instrument. The reliability of the instrument was established using the Cronbach Alpha method, yielding a coefficient of 0.79. The researcher, along with research assistants, visited each university to administer the instrument. The research questions were answered descriptively using frequency counts, mean scores, and standard deviations. The research hypotheses formulated were analysed using simple regression and tested at 0.05 level of significance. The findings revealed that positive peer support, encouragement, and social acceptance significantly influenced female students' participation in sports activities. Based on the findings of the study, it is recommended that universities foster inclusive sporting environments that promote female students' participation in sports.

Keywords: female participation, extramural sports, social factors, peer interaction, parental attitude, age, university students

Introduction
Participation in sports is recognised for numerous advantages, including the improvement of physical health, the promotion of mental well-being, and the cultivation of social relationships. In higher education, extramural sports offer significant chances for university students to participate in physical activity, cultivate social connections, and improve their well-being (Pope & Pritchard, 2019). Nevertheless, female

university students frequently encounter distinct challenges that may impede their engagement in these activities. Social factors, including peer interaction, parental attitudes, and age, significantly influence young women's sports experiences (Fahlman et al., 2019). The study aims to determine the social determinants affecting female students' involvement in extramural sports and to provide strategies for enhancing their participation.

Participation in sports gives female students an opportunity for physical exertion, personal development, and social empowerment; nonetheless, a large gender discrepancy in sports involvement exists throughout the country. Research indicated that male members of sports clubs are more prone to adopt sexist attitudes compared to their non-member counterparts, independent of the amount of gender inequality in their nations (Roh & Chang, 2022). In India, women have various challenges that impede their involvement in sports, including financial limits, limited facilities, social factors, and sociocultural hurdles (Willinger et al., 2022). Research conducted by Nxumalo and Beetge (2017) observed many difficulties that inhibit female university students' engagement in sports, such as time limitations, mobility challenges, increased membership costs, and insufficient facilities. Women in urban and rural areas place financial and individual interests over family and social constraints.

Extramural sports are crucial for students' overall development because they enhance their physical well-being and promote resilience, teamwork, and leadership (Pope & Pritchard, 2019). Global higher education institutions acknowledge the importance of sports as an essential part of a well-rounded education. Cultural and societal norms frequently hinder women's involvement in traditionally male-dominated sports in Nigeria (Ogunleye, 2016). Positive peer impacts can augment sports engagement, while detrimental interactions may inhibit it (Smith et al., 2018). It is crucial to consider these factors to enhance female involvement in university athletics.

Recent studies have emphasised the substantial impact of social variables on women's athletic participation (Biddle & Mutrie, 2019; Beaton et al., 2020). Peer impact is particularly significant in academic environments, where students frequently develop supportive relationships. Research by Johnson et al. (2021) indicated that female students who perceive encouragement from friends and classmates are more likely to engage in physical activities. Moreover, the phenomenon of peer modeling—in which individuals are motivated by the behaviours of others— has been shown to increase involvement rates (Tucker & Gilliland, 2020). Cultural influences significantly shape women's

perceptions of participation in sports within the Nigerian context. Ogunyemi (2022) observed that conventional gender roles often inhibit female participation in competitive sports. Comprehending these relationships is crucial for formulating effective ways to promote female involvement in extramural sports.

Peer interaction serves as a social determinant influencing female participation in extramural sports. Peer interaction denotes the social involvement and interaction that happens among individuals of equal age, status, or shared interests within a peer group. This form of socialisation is essential for influencing human growth, behaviour, and mindsets, especially during childhood and early adulthood. Peer interactions appear in several forms, such as acquaintances, socialising, experiences that are shared, and interactions within peer groups. Inspiring peers who prioritise sports can generate constructive peer pressure, inspiring females to overcome obstacles and participate actively. Negative peer pressure or mockery associated with sports participation may greatly discourage somefemale students from participating in sports, thereby avoiding social scrutiny. Female students may experience negative stereotypes or discrimination from their male peers, which can make them feel excluded or deterred from competing in sports. Social norms and expectations for gender roles and physical appearance can deter female students from participating in sports.

The interaction of these factors may foster an environment that diminishes motivation and support for female students' participation in sports.

The attitude of parents substantially affects female engagement in sports. Research indicates that supportive parental attitudes promote engagement, but critical or indifferent parental behaviours may impede participation (Gould et al., 2018). Involving parents in athletic events and fostering a positive view of female athletes can enhance their daughters' engagement in sports.

The age of female students may affect their degree of involvement in sports. Adolescent girls may engage in social relationships via athletics, whereas older students may prefer academic commitments or other competing responsibilities (Caldwell & Smith, 2021). Lazaridis et al. (2021) observed the impact of social factors, including gender, age, organised sports participation, and family wealth, on adolescents' global self-worth and extracurricular physical activity. Understanding the influence of age on participation can enable tailoring programs to more effectively meet the requirements of various groups.

Despite the widely documented

benefits of sports involvement for female university students, such as physical fitness, improved mental well-being, and enhanced social networks, a considerable number of females continue to be noticeably not represented in extramural sports programmes. This gap highlights concerns regarding the obstacles that hinder female students' involvement in higher education settings. Social factors, such as social interactions, parentalattitudes, and age, significantly influence sports participation, however their impact on female university players remains under explored. Peer relations can either facilitate or hinder engagement; positive feedback from peers may encourage activity, whilst negative perceptions within social groups might result in withdrawal from athletic activities. The disposition of parents towards sports can significantly affect a daughter's inclination to join; supportive households foster engagement, whereas critical or apathetic attitudes may dissuade aspiring athletes.

Moreover, age- related factors introduce additional complexity; younger female students may possess greater opportunities and inclination to participate in sports as they pursue social connections, whereas older students may encounter competing obligations, such as academic demands or employment, that restrict their involvement. This study seeks to examine the impact of social factors—peer interaction, parental attitude, and age—on the involvement of female university students in extramural sports. Comprehending these dynamics is crucial for formulating targeted strategies to enhance female student engagement, guarantee equitable access to sports programmes, and cultivate an environment where all students can reap the benefits of participating in physical activities.

Objectives of the Study

The study was carried out in order to:

1. assess the level of female students' participation in extramural sports.
2. investigate the social factors (peer interaction, parental attitude, and age) that influence female students' participation in university extramural sports in Southwest Nigeria.

Research Questions

The following research questions were raised to guide the study:

1. what is the level of female students' participation in university extramural sports in Southwest Nigeria?
2. what are the social factors (peer interaction, parental attitude and age) influencing female students' participation in university extramural sports?

Research Hypotheses

Three hypotheses were formulated and tested:

1. Peer interaction will not significantly influence female students' participation in University extramural sports.
2. Parental attitude will not significantly influence female students' participation in University extramural sports.
3. Age will not significantly influence female students' participation in university extramural sports.

Materials and Methods

The study adopted a descriptive survey research design. The population of the study consisted of all female undergraduate athletes in the 19 public universities in Southwest Nigeria. The sample of the study consisted of 496 female university students who were selected from universities in Southwest Nigeria using a multistage sampling procedure. An instrument tagged 'Questionnaire on Social-Cultural Factors of Female Participation in Extramural Sports (SCFFPES) was used to collect data for this study. To determine the validity of the instrument, copies of the instrument were subjected to thorough screening by experts in Human Kinetics and Health Education, Tests, Measurement and Evaluation in the Faculty of Education, Ekiti State University, Ado-Ekiti. The reliability of the instrument was established through the use of the Cronbach's alpha method in a one-shot test, which yielded a reliability coefficient of 0.79. The administration of the instrument was done by visiting the sampled schools. The collected data were analysed using descriptive and inferential statistics.

Results

Research Question 1: What is the level of female participation in University extramural sports in South West Nigeria?

Table 1: Mean and Standard deviation on the level female participation in university extramural sports in Southwest Nigeria.

Statement	N	$\bar{x}$	S.D	Decision
Female university studens actively participate in a wide range of extramural sports activities in my university.	496	3.01	1.17	Agreed
Female are well -represented in inter - University sports competitions.	496	2.36	1.03	Disagreed
Female hold leadership positions in sports clubs and organizations.	496	2.14	0.94	Disagreed
Female frequently engage in friendly matches and tournaments with other universities.	496	2.80	1.15	Agreed
Female have access to training and coaching resources to improve their sports skills.	496	3.20	0.78	Agreed
Female are encouraged to participate in both competitive and recreational sports.	496	3.24	0.87	Agreed
Female receive recognition and appreciation for their achievements in sports.	496	3.28	0.70	Agreed
Female demonstrate enthusiasm and dedication to extramural sports activities.	496	2.55	0.92	Agreed
Female have equal opportunities as male students to represent the University in sports events.	496	2.11	1.00	Disagreed
Female actively support and encourage each other's participation in sports.	496	3.31	0.79	Agreed
	Grand mean = 2.80			

Mean cut off = 2.50

Table 1 shows the level of female participation in university extramural sports in Southwest Nigeria, as measured by mean score and standard deviations. The data reflects responses from 496 participants. Female university active participation in a wide range of sports activities garnered a mean score of 3.01 with a standard deviation of 1.17, actively participated in a wide range of extramural sports activities. However, the representation of females in inter-University sports competitions scored lower at 2.36 with a standard deviation of 1.03. Similarly, female leadership in sports clubs and organizations scored 2.14 with a standard deviation of 0.94. On the other hand, females' access to training resources received a higher mean score of 3.20 with a lower standard deviation of 0.78, indicating more agreement on this positive aspect. The Grand mean of 2.80 is slightly higher mean cut off of 2.50. This implies that the level of female participation in extramural sports slightly high in extramural sports in Southwest Nigeria but limited involvement in inter-university competitions and leadership roles.

Research Question 2

What are the social factors (peer interaction, parental attitude and age) influencing female participation in university extramural sports?

Table 2: Aggregate mean of social factors influencing female participation in university extramural sports.

Social Factors	Mean	Std. Deviation
Peer Interaction	9.81	3.17
Parental Attitude	9.74	3.00
Age	9.86	3.10

Table 2 shows that, peer interaction tops the aggregate mean value of social factors influencing female students' participation in extramural sports. The standard deviation which ranges from 2.97 (minimum) – 3.17 (maximum) indicated that the respondents have consensus of opinion.

Testing of Hypotheses

Hypothesis 1

Peer interaction will not significantly predict female students' participation in University extramural sports.

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value
	B	Std. Error	Beta		
(Constant)	13.513	.674		20.056	.000
Peer Interaction	.589	.065	.376	9.026	.000
R^2	0.142				
AdjR^2	0.140				
F-stat.	81.468				
P-value	.000				

p<0.05

y =13.513 + .589x

Table1 shows that regression of peer interaction on female students participation in university extramural sports was significant [R^2 = .0.142, AdjR^2 = .0.140, F= 81.468, p=0.000) because the p-value of 0.000 was less than 0.05 level of significance. About 14% of the variance in female participation in University extramural sports can be explain by peer interaction (AdjR^2= 0.140×100), while the remaining 86% could be attributed to variables other than peer interaction. The result further indicates that a unit

positive change in peer interaction constitute about 0.376 (Beta =0.376, t =9.026, p=.000) significant increase in female participation in extramural sports. Thus, the null hypothesis that peer interaction will not significantly predict female participation in University extramural sports was not accepted. It is concluded therefore that peer interaction significantly predicts on female participation in university extramural sports.

Hypothesis 2: Parental attitude will not significantly predict female students participation in University extramural sports.

Table 2: Simple Linear Regression Analysis of the prediction of female students participation in sports by parental attitude

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value
	B	Std. Error	Beta		
(Constant)	11.692	.679		17.233	.000
Parental Attitude	.780	.067	.466	11.720	.000
R^2	0.218				
AdjR^2	0.216				
F-stat.	137.368				
P-value	.000				

p<0.05

y =11.692 + 0. .780x

Table 2 shows that simple linear regression of parental attitude on female students participation in university extramural sports was significant [R^2 = .0.218, AdjR^2 = .0.216, F= 137.368, p=0.000) because the p-value of 0.000 was less than 0.05 level of significance. About 21.6% of the variance in female participation in University extramural sports can be explain by parental attitude (AdjR^2= 0.216×100), while the remaining 78.4% could be attributed to variables other than parental attitude. The result further indicates that a unit positive change in parental attitude constitute about 0.466 (Beta =0.466, t=11.720, p=.000) significant increase in female participation in extramural sports. Thus, the null hypothesis that peer interaction will not significantly predict female participation in University extramural sports was not accepted. It is concluded therefore that parental attitude significantly predicts on female participation in University extramural sports.

Hypothesis 3: Age will not significantly predict female participation in University extramural sports.

Table 3: Regression Analysis of the prediction of female students' participation in sports by Age.

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value
	B	Std. Error	Beta		
(Constant)	9.649	.590		16.352	.000
Age	.979	.057	.611	17.142	.000
R^2	0.373				
AdjR^2	0.372				
F-stat.	293.850				
P-value	.000				

p<0.05
y = 9.649+ .979x

Table 3 shows that simple linear regression of age on female students participation in university extramural sports was significant [R^2 = .0.373, AdjR^2 = .0.372, F= 293.850, p=0.000) because the p-value of 0.000 was less than 0.05 level of significance. About 37.2% of the chances for female participation in University extramural sports can be explained by age (AdjR^2 = 0.372×100), while the remaining 62.8% could be attributed to variables other than age. The result further indicates that a unit increase in preference for age constitute about 0.611 (Beta =0.611, t=17.142, p=.000) significant increase in female participation in extramural sports. Thus, the null hypothesis that age will not significantly predict female participation in University extramural sports was not accepted. It is concluded therefore that athlete age significantly predicts on female participation in university extramural sports.

Discussion

The findings revealed that peer interaction significantly predict female university student's participation in Extramural sports. This is in connection with the study of Smith et al. (2018) that highlight this dynamic by emphasising that positive peer influence fosters increased sports participation, whereas negative interactions can have the opposite

effect. Their research supports the argument that peer interactions serve as both enablers and barriers to female sports involvement, aligning with broader discussions on social influence in athletic engagement.

The study showed that parental attitude s ignificantly predicts female participation in university extramural sports. This supports the findings of Gould et al., (2018) that parental attitudes foster engagement, but critical or apathetic parental actions may hinder participation.

The study also revealed that age of the female university students significantly predicts female participation in university extramural sports. This is in conjunction with the study of Lazaridis, et. al., (2021) that age and family wealth were significant predictors of the out of school physical activities. Also, this is in agreement with Caldwell & Smith (2021). that adolescent girls may pursue social interactions through athletics, but older students may prioritise academic obligations or other competing responsibilities.

Conclusion and Recommendations

The research emphasised the significance of social factors influencing female university students' engagement in extramural sports. Peer interactions and parental attitudes are essential for improving engagement, although age-related factors present additional barriers. By identifying and mitigating these variables, institutions can formulate focused measures to enhance participation rates among female students. It is suggested that female university students promote more participation among their peers in athletic activities and that family-orientated sports events and workshops be organised to foster parental involvement and support for female students. Additional study is required to investigate longitudinal variations in involvement and the effects of specific interventions.

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