

ISSN: 2756 - 6749



# **RIMA INTERNATIONAL JOURNAL OF EDUCATION**

**Vol. 3 (Number 2) July, 2024**

**Published by:**

Faculty of Education,  
Sokoto State University,  
Sokoto, Nigeria

# **RIMA INTERNATIONAL JOURNAL OF EDUCATION**

Vol. 3 (Number 2): July, 2024

Published by:

Faculty of Education,  
Sokoto State University,  
Sokoto, Nigeria

# **RIMA INTERNATIONAL JOURNAL OF EDUCATION**

**ISSN: 2756 - 6749**

**Vol. 3 (Number 2): July, 2024**

Copyright: Faculty of Education,  
Sokoto State University,  
Sokoto, Nigeria.

**EDITORIAL BOARD**

Prof. M. U. Tambawal	-	Editor-in-Chief
Dr. S. I. Bashar	-	Managing Editor
Prof. N. I. Tambuwal	-	Associate Managing Editor
Dr. L. A. Yusuf	-	Member
Dr. S. A. Rufai	-	Member
Dr. S. A. Tijani	-	Member
Dr. M. S. Naiwait	-	Member
Dr. U. Galadima	-	Member
Dr. N. M. Hassan	-	Member
Dr. (Mrs.) M. Ezeamagu	-	Member
Dr. H. Y. Bodinga	-	Member
Dr. Faruku Aliyu	-	Member
Dr. R. U. Okoro	-	Member
Dr. Usman Galadima	-	Member
Dr. N. A. Katami	-	Member
Dr. Shamsudeen Bello	-	Member
Dr. Haliru Shehu	-	Member
Mr. Hassan Aliyu	-	Editorial Secretary

## CONSULTING EDITORS

- |   |  |
|---|--|
| Prof. A. B. Maina                       | - Ahmadu Bello University, Zaria   |
| Prof. A. I. Gambari                     | - Federal University of Technology, Minna                                  |
| Prof. M. M. Jagaba                      | - Usmanu Danfodiyo University, Sokoto                                      |
| Prof. M. Sadiq                          | - Ahmadu Bello University, Zaria   |
| Prof. M. A. Ajayi                       | - University of Ibadan   |
| Prof. Bayo Lawal                        | - University of Ilorin   |
| Ass. Prof. Muhammad Zahiri<br>Awang Mat | - Seri Bawagan Religious Teachers University College,<br>Brunei Darussalam |
| Ass. Prof. (Mrs.) Suhaila<br>Hussein    | - International Islamic University, Malaysia, Kuala<br>Lumpur, Malaysia    |
| Prof. M. A. Yushau                      | - Usmanu Danfodiyo University, Sokoto                                      |
| Prof. (Mrs.) Rabi Muhammad              | - Usmanu Danfodiyo University, Sokoto                                      |

**Address for Correspondence:** The Editor-in-Chief  
Rima International Journal of Education,  
Faculty of Education, Sokoto State  
University, PMB 2134, Along Birnin  
Kebbi Road, Sokoto, Sokoto State,  
Nigeria.  
E-mail Address: [editor@rijessu.com](mailto:editor@rijessu.com)

### **EDITORIAL NOTE**

I have the delight and privilege to write as Editor-in-chief of the *Rima International Journal of Education (RIJE)*, an official research publication of the Faculty of Education, Sokoto State University. This edition (Volume 2: No. 2) of the *RIJE* has twenty four (24) articles from distinguished scholars and educators, poised to report cut-edge research findings and discourse on contemporary educational issues with implications for pedagogy, national and global development.

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

Prof. M. U. Tambawal,  
**Editor-in-chief**

## CALL FOR PAPERS

The Editorial Board invites interested scholars and researchers to submit original manuscripts for publication. The Journal is a bi-annual publication of the Faculty of Education, Sokoto State University, Sokoto, designed to disseminate relevant research findings related to all fields of education. Both empirical and theoretical papers that are articulately written based on contemporary educational issues that have national and international relevance shall be accepted for publication. The manuscript shall not be under consideration elsewhere for publication.

### Guidelines for Manuscript Submission

- i. **Language:** Manuscripts meant for submission should be written in English language with strict adherence to British standard.
- ii. **Paper Size, Font and Length:** Manuscript prepared for submission should be typed in Microsoft Word on A4 paper size using Times New Romans, font size 12 and 1.5-line spacing. The manuscript should not be more than 15 pages including references.
- iii. **Title Page:** The title page should capture the title of the manuscript which should not be too lengthy, the author(s) name(s) with surname in Upper Case, institution's affiliation, current mailing address, valid e-mail address, Phone No(s) and full postal address of the main author and co-authors.
- iv. **Abstract:** Manuscripts must be accompanied with an abstract of not more than 200 words comprising essential components of the manuscripts. Avoid citations in the abstract. After the abstract, the authors should provide maximum of 5 key words.
- v. **Organization:** The manuscript should be explicitly presented under various headings and sub-headings. The ideas should be properly organized. Coherent and sequential. More importantly, the following should be made conspicuous while preparing empirical papers: **Introduction** (indicating rationale for the study, review of related literature, problem statement, and purpose of the study), **Methodology**, **Results**, **Discussion**, **Conclusion** and **Recommendations**.
- vi. **Arrangement of Tables/Figures:** The tables/figures should be arranged properly and neatly using the latest APA style and the title of the tables/figures should appear on top of each table such as, (Table 1; Table 2, etc/Figure 1, Figure 2, etc). There should be an avoidance of moving over to the next page.
- vii. **Arrangement of Text-Quotations:** Indication of 1.5 in both left and right should be used for a particular quotation that is up to 40 words or more. Hence, the page number of the quotation should be provided in bracket at the end of the quoted words or passages.
- viii. **Findings/Results:** This should be clearly presented in tables and figures with appropriate headings/sub-heading. Do not restate your research questions or hypotheses under this section.
- ix. **Referencing Style:** All in-text citations and references should confirm strictly with the latest APA style/format.
- x. **Submission:** Manuscripts should be submitted electronically via e-mail: [submission@rijessu.com](mailto:submission@rijessu.com)

## **PUBLICATION FEES/BANK DETAILS**

There would be a charge of ₦5,000 (USD15.00) for vetting each manuscript submitted for consideration and if the article is considered for publication, the author(s) will be required to pay the sum of ₦20,000 as publication fees. The payments are considered as operating costs for the production of the Journal. Hence, the payments should be forwarded to the Journals Account as follows:

Account Name: Rima International Journal of  
Education Account No:0001864659  
Bank Name: Taj Bank Plc

After publishing the article, the lead/main author will receive a complimentary copy of the printed journal in which the authors paper appears. However, additional copy can be purchased by contacting the Editor-in-Chief, through the correspondence address.

### **EDITOR-IN-CHIEF**

Prof. M. U. Tambawal,  
Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University,  
Sokoto GSM-No.:  
+2348035275959

### **MANAGING EDITOR**

Dr. S. I. Bashar,  
Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University,  
Sokoto GSM-No.:  
+2347062250773

### **ASSOCIATE MANAGING EDITOR**

Prof. N. I. Tambuwal,  
Department of Science  
Education, Sokoto State  
University, Sokoto GSM-No.:  
+2348036084320

### **EDITORIAL SECRETARY**

Hassan Aliyu  
Department of Science  
Education, Sokoto State  
University, Sokoto GSM-No.:  
+2348032527172



## TABLE OF CONTENTS

Cover page	i
Editorial Board	ii
Consulting Editors	ii
Editorial Note	iii
Call for Papers	iv
Table of Contents	vi
1 Designing Stem Learning Activities In Basic Secondary Schools Mathematics Classrooms In Nigeria — <i>Usman Galadima, Muhammad Nasiru Hassan, &amp; Bashar Umar Binji</i>	1-11
2 AI-Integrated Holistic Framework for Teacher Education to Enhance Instructional Effectiveness in Diverse Educational Environments in Bayelsa State — <i>Anselem Anayochukwu Anih &amp; Bartholomew Oluchi Ukeh</i>	12-21
3 Assessing Undergraduate’s Attitude and Academic Engagement in Computer-Based Test Courses in Nigerian University — <i>Muhinat Bolanle Bello &amp; Iyanuoluwa Grace Oyedepo</i>	22-37
4 Assessment of Metalwork Instructional Materials for Design Thinking Implementation as Innovative Approach in Technical Colleges in Kwara and Niger States, Nigeria — <i>Shefiu Abdulrauf, Aede Hatib Musta’amala Jamal, Muftau Kayode Raji, &amp; Alhassan Ndagi Usman</i>	38-49
5 The Effect of Social Media Usage and Anxiety on Academic Achievement among Senior Secondary School Students in Sokoto State — <i>Ramatu Muhammad Maiwada</i>	50-70
6 The Contributions of Modibbe to the Growth of Female Education and Entrepreneurship in Sokoto city in the 19th and 20th Centuries — <i>Nabilah Lawal Bako</i>	71-82
7 Perception of NCE Biology Students towards Incorporation of Digital tools for E-learning in Federal College of Education, Zaria — <i>Alafiatayo Bunmi Mercy &amp; Dauda Nana Oziehisa</i>	83-93
8 Influence of Career Counselling on Choice of Future Occupation among Undergraduates’ Students of Sokoto State University, Sokoto — <i>Mukhtar Nawait Salihu &amp; Abubakar Mukhtar Gwanga</i>	94-101
9 Effect of Interactive Teaching Method on English Reading Comprehension Achievement of Junior Secondary School Students in Sokoto State — <i>Sani Garba &amp; Yusuf Abubakar</i>	102-109

10	Guidance and Counseling: Tools in Effective Pedagogy in Schools — <b>Ramatu Muhammad Maiwada &amp; Fatima Abubakar Lawal</b>	110-116
11	ASEI-PDSI Approach Level Of Awareness Of Among Mathematics And Science Education Student In Sokoto State University — <b>Aliyu Garba, Hassan Aliyu &amp; Faruku Aliyu</b>	117-131
12	Gender Differences On Achievement And Attitude of Physics Students In Senior Secondary School Kagarko Local Government, Kaduna State — <b>Akuso Simon, Orji Nwokedirioha Onyemaechi &amp; Ode John Segun</b>	132-142
13	Relationship between Protection of Teacher Rights to Freedom from Discrimination and Managerial Effectiveness in State Universities in North Western Zone, Nigeria — <b>Bello Musa &amp; Usman Maryam Gogo</b>	143-154
14	Professional Development and Ethics for Adult Educators: A Rebuilding Trust in Adult Education Practice — <b>Emmanuel Tayo Daramola</b>	155-163
15	Psycho-Demographic Factors and Attitude towards E-Learning among Students of Adeyemi Federal University of Education, Ondo, Nigeria — <b>Saheed Abiola Saka, Akinyemi Olufunminiyi Akinbobola &amp; Adekemi Anthonia Olorunfemi</b>	164-174
16	Impacts of Artificial Intelligence-Based Tutoring System in Enhancing Learning Experience and Performance — <b>Nuraddeen Malami</b>	175-181
17	Effects of Talent Management Strategies on Career Progression of Business Educators in Nigerian Colleges of Education — <b>Olatunbosun Emmanuel Ajisafe &amp; Victor Imuentiyan Igbinedion</b>	182-192
18	Students' Perceptions on Dimensions of Educational Philosophies: Towards Curriculum for Activating Intellectual Virtues and Inculcating Moral Values at SSU, Sokoto State, Nigeria — <b>Ahmad Tijani Surajudeen and Haliru Shehu</b>	193-210
19	Incorporating Entrepreneurship Education in Educational Management Curricular in Universities for Job Creation and Self Reliance in Nigeria — <b>Sa'adu Isa Bashar &amp; Sambo Zayyanu</b>	211-219
20	The Role of Libraries in Harnessing Technology for Promoting Digital Inclusion in Nigeria — <b>Aisha Sadiq Yelwa</b>	220-231
21	The Role of Muslim Women in Da'wah and Education — <b>Abdullahi Dalhatu, Ibrahim Lawal Hunkuyi, &amp; Shafaatu Ahmad Aliyu</b>	232-242
22	Assessment of Self-Management Counselling Technique and Social Phobia Among Nigerian Undergraduate Students — <b>Tanimu</b>	243-253

***Umar – Mcasson, Musa Yusuf Kabara, & Nasiru Ibrahim***

- |    |  |         |
|----|--|---------|
| 23 | Role of PhET Interactive Simulation as Virtual Technology that Facilitates Learning of Chemistry: A Systematic Review of Chemical Concepts, Learning Theories, Instructional Modes and Strategies — <b><i>Hassan Aliyu, Anas Abdullahi &amp; Aliyu Garba</i></b> | 254-279 |
| 24 | Effect of Drugs Abused on Academics Achievement among Senior Secondary School Students in Yauri Local Gov't Area, Kebbi State Implication for Counselling — <b>Mukhtar Nawait Salihu &amp; Aliyu Papa Khalied</b>  | 280-288 |

## DESIGNING STEM LEARNING ACTIVITIES IN BASIC SECONDARY SCHOOLS MATHEMATICS CLASSROOMS IN NIGERIA

<sup>1\*</sup>Usman Galadima, <sup>2</sup>Muhammad Nasiru Hassan, and <sup>3</sup>Bashar Umar Binji

<sup>1,2&3</sup>Department of Science Education,  
Faculty of Education,  
Sokoto State University, Sokoto, Nigeria  
Email: [usman.galamida@ssu.edu.ng](mailto:usman.galamida@ssu.edu.ng)

---

### Abstract

*Many stakeholders in education believe that Science, Technology, Engineering, and Mathematics (STEM) strategy is an effective pedagogy that provides the learners with creativity, innovative and higher-order thinking skills needed in designing STEM learning activities. The STEM learning activities provide opportunities for the learners to have the exposure that requires them to become scientists, technicians, engineers, and mathematicians in solving real-world problems. Therefore, the purpose of this study is to provide STEM stakeholders in basic secondary education with valuable information for designing STEM learning activities in Nigeria and to determine the participants excitement and interest in STEM activities. The participants were purposively chosen as an intact class with a view to engage them in STEM learning activities and also the STEM challenges. This study was based on the construction of paper planes, bridges, the making of towers, and catapults. At the end of the activities, the opinion form was used to gather the participants' views about the activities using an open-ended STEM Activities Evaluation Questionnaire (STEMAEQ). The data were analyzed using the descriptive analysis method. The results of the study show that the participants found the activities interesting, exciting and fun, as well as conducive to learning STEM fields and higher-order thinking skills. It is believed that this study will provide practical and theoretical contributions to the fields of STEM activities.*

**Keywords:** STEM, STEM Learning Activities, Mathematics Classroom

### Introduction

Science, Technology, Engineering, and Mathematics (STEM) is a field which empowers future generations to grow dynamic and innovative ideas in fostering creativity and teamwork. STEM is also a new strategy that emphasizes connections among Science, Technology, Engineering, and Mathematics that increase students' interest and prepare them to face the challenges of the changing world. Nowadays, Science, Technology, Engineering, and Mathematics (STEM) emphasises transdisciplinary among STEM disciplines and devise a solution with multiple disciplines in mind for solving real-life problems (Dan & Gary, 2018).

STEM has been adopted by some research institutes, as part of their corporate social responsibility through creativity, digital literacy, collaboration, teamwork and communications. Hence, today the understanding of STEM fields is unachievable without a solid mathematics and science foundation (Fredricks et al., 2016). STEM is considered as connected concepts and content from multiple STEM disciplines in the

curriculum through an increasing focus on students' persistence in STEM (Skinner et al., 2017; Struyf et al., 2019). Relatively, STEM is better understood as a connected discipline by eliminating disciplinary boundaries and teaching them as a single distinct entity (Galadima et al., 2019b; Nadelson & Seifert, 2017).

Thus, this connection between the STEM disciplines increases preparation and careers in developing the STEM-capable workforce that improves STEM literacy needs. The need for more engineers, technicians, scientists, and mathematicians (such as Software developers, Information security analysts, Architects, Actuarial Scientists, Cost estimators, Statisticians, Web Developers, etc.). This necessitates for more innovative and creative workforce needed to compete and spar in a global marketplace (Morrison & Bartlett, 2009; National Research Council, 2011). The emphasis of STEM strategy focuses on the stakeholders being aware of what and how to design and apply knowledge and practices of STEM disciplines (Nadelson & Seifert, 2017). The application of knowledge allows the learners to develop a deep understanding of STEM concepts, processes, and how they are interrelated. In supporting the statement, Nadelson and Seifert (2017) indicated that teaching STEM could be more efficient than teaching independent STEM subject.

Taken together, this rationale supports the continually growing demand for the required STEM skills to meet the present and future global economic and social challenges. The emphasis of STEM strategy focuses on the stakeholders being aware of what and how to design and apply knowledge and practices of STEM disciplines (Nadelson & Seifert, 2017). The application of knowledge allows the learners to develop a deep understanding of STEM concepts, process, and how they are interrelated. In supporting the statement, Nadelson and Seifert (2017) indicated that teaching STEM could be more efficient than teaching segregated STEM subjects. Additionally, STEM-focused on the student-centered pedagogies, science and mathematics content, technology integration, and the use of engineering design process that enables to develop of teamwork and communication skills (Stohlmann et al., 2013).

Literature bound that STEM activities develop students to be self-reliant, logical thinkers, innovators, problem solvers, and technologically literate (Galadima, 2020; Stohlmann et al., 2012). However, developing students' skills in STEM activities require careful selection of materials and designing appropriate STEM learning modules and activities. Substantial literature, indicates STEM approach develops students' interest, and performance using different approaches. For example, the use of technology in STEM activities improves interest and performance in STEM and fostering abilities for innovation and invention (Abdioglu et al., 2021; Siregar et al., 2023; Sivaraj et al., 2019). Consequently, Hassan et al. (2020, 2023) affirmed that the use of engineering design with the van Hiele model develops students' geometric thinking skills at basic secondary school. Also develop hearing-impaired students' geometric thinking skills (Binji et al., 2022).

Moreover, Galadima (2023), indicates that STEM learning activities develop pre-service teachers' interest towards STEM activities. In addition, STEM activities allow the learners to focus on big ideas that are interrelated between the STEM subjects, make STEM experience more fun and provide opportunities for the learners to have necessary skills in hands-on challenges (Ibid). In spite of the importance of STEM in the 21st

century, there is limited research conducted on STEM activities in Nigeria such as the construction of paper planes, bridges, making towers, and catapults (Galadima, 2020).

According to English and King (2019), these types of activities are designed to scaffold the development of the learners' foundation of STEM knowledge. Paper planes have been recognised as flying toys. In the construction of paper planes, the learners work in development teams for designing, making, and testing the paper planes (Frydenberg et al., 2018). The construction of bridges is a learning idea that enhances 21st-century STEM initiative that promotes problem-solving skills. By learning how to build bridges, the learners would learn how engineers make designs and structures that people use every day in all parts of the world (English & King, 2019). The STEM activities used in this study potentially helped learners in other areas, increasing a better understanding of STEM experience and new pedagogies in their future classroom practice.

Likewise, Galadima (2023); Galadima et al. (2019b) affirmed that STEM activities improve the attention, and interest of the learners in mathematics classrooms. The present study adopted a STEM learning activities module for Basic Secondary Schools with the hope to develop basic secondary school students' interest and develop them with 21st-century skills through STEM learning activities. See Table 1 below for the STEM learning module.

**Table 1:** Example of STEM Learning Activities Module for Basic Secondary Schools

Week	STEM Activities/Challenges
1	<p><b>Making a Paper Plane:</b> Engaging the learners in the group to make a paper plane for making the class fun and as an introduction to STEM activities.</p> <ol style="list-style-type: none"> <li><b>Situation</b> What makes an aeroplane fly farthest and highest?</li> <li><b>Challenge</b> Construct a paper plane and find the distance of flight trials.</li> <li><b>Constraints</b> 15minutes time limit; must use only the material provided, but not all resources should be used.</li> <li><b>Resources</b> Sheet of A4 paper; ruler; scissors; measuring tape.</li> <li><b>Evaluation</b> To find the farthest paper plane by throwing the object and measuring the distance that it hit the ground with measuring tape.</li> </ol>
2	<p><b>Construction of Bridge with Straws:</b> Engaging the learners in a group to build a bridge using straws and making the class fun.</p> <ol style="list-style-type: none"> <li><b>Situation</b> How to make a strong Bridge?</li> <li><b>Challenge</b> Build a strong bridge and test the strength contest that can span a gap of at least 20cm and support 4000g of weight coins as possible.</li> <li><b>Constraints</b> 25minute time limit; must use only the material provided, but not all resources should be used.</li> <li><b>Resources</b> 30 pieces of straws; ruler; scissors; 1 roll tape; weight coins; and books.</li> <li><b>Evaluation</b> Test of strength contest of bridges using straws in testing how strong enough that the bridge can support a suitable weight/load placed on it to collapse.</li> </ol>
3	<p><b>Free-Standing Spaghetti Tower:</b> Engaging the learners in a group to make a free-standing Spaghetti tower for making the class fun</p> <ol style="list-style-type: none"> <li><b>Situation</b> How to make a free-standing spaghetti tower?</li> <li><b>Challenge</b> Build the tallest free-standing tower using not more than 30 sticks of spaghetti. One marshmallow must be on top of the tower. Also, the tower has to stand firmly on its own.</li> <li><b>Constraints</b> 20minutes time limit; must use only the material provided, but not all resources should be used.</li> </ol>

4.	<b>Resources</b>	20 sticks of spaghetti; ruler; and 1 yard of masking tape; one marshmallow; measuring tape to measure the height after the challenge; video Clip, projector, sound system; and stopwatch.
	<b>Evaluation</b>	Identify the winning team and ensure they get applause and a prize; Measure the height of the free-standing tower
4	<b>Making Catapult using Popsicles:</b>	Engaging the learners in a group to build a catapult using popsicles and rubber bands
	1. <b>Situation</b>	Focussed on finding a way to propel objects at long distances
	2. <b>Challenge</b>	Engaging learners in a group to make a catapult that can be used to throw marshmallows to the longest distance possible.
	3. <b>Constraints</b>	20minutes time limit; must use only the material provided, and throw marshmallows accurately to hit the targets.
	4. <b>Resources</b>	popsicle sticks, safety goggles, and 1 yard of masking tape; a bag of marshmallows; measuring tape; rubber bands;
	5. <b>Evaluation</b>	Use tape to measure and record the accurate distance that it hit the target

---

**Source:** Galadima (2020)

### **Problem Statement**

In an attempt for tackling the societal issues of learning STEM activities, there is a need for fostering scientific, technological, engineering and mathematical innovations. In line with this, the developed nations are calling for interconnected nature of STEM in which the learners get to explore the connection between the STEM disciplines (Stohlmann et al., 2012). The reality in Nigeria is that, despite all the calls for nationwide development in learning STEM education, the STEM disciplines are still taught separately (Galadima et al., 2019b; Okpala, 2012) and the design of STEM learning activities is, however, still limited. Adversely, if STEM learning activities are not designed in the teaching and learning STEM education in Nigeria, it will affect the learners' awareness and interest in STEM, which is tantamount to the stagnation of knowledge in the midst of global scientific and technological advancements.

In recent years, several studies have highlighted the need for providing STEM learning activities (Akçay Malcok & Ceylan, 2022; Buber & Unal Coban, 2023; Daher & Shahbari, 2020; Dilek et al., 2020; Galadima, 2023; Gazibeyoglu & Aydin, 2019; Hiğde & Aktamış, 2022; Kahraman & Doğan, 2020; Karakaya et al., 2020; Pekbay, 2022; Silk et al., 2010; Yalçın & Erden, 2021; Yıldırım, 2021) to meet contemporary global demands, social and technological challenges like efficient healthcare, technological development as well as sufficient and sustainable energy (English, 2016; Thibaut et al., 2018). The importance of providing strong learning activities in science, technology, engineering and mathematics (Hiğde & Aktamış, 2022) has been stressed (Galadima et al., 2019a; Okpala, 2012). To achieve this in Nigeria, designing STEM learning activities are required particularly at the basic level of education. In view of these, the present research used STEM learning activities to develop students' interest, problem solving skills and other 21st century skills needed for the development of our society.

### **Learning STEM Activities in Mathematics Classroom**

Aligning teaching mathematics with STEM is important as mathematics is one of the components of STEM disciplines available for explaining an observation, formulating theories and helping in making engineering designs process (Galadima et al., 2019b;



Okpala, 2012; Shahali et al., 2016). The mathematics in the STEM classroom focuses on content that builds skills in developing hands-on activities using problem-based learning, project-based learning and inquiry-based learning in the context of STEM (Milaturrahmah et al., 2017). The practice of teaching mathematics with a STEM approach involves preparing materials and tools for students to explore and solve a real-world problem through designing, expressing, testing, and revising their ideas (Galadima, 2023; Milaturrahmah et al., 2017; Stohlmann et al., 2012).

The materials and tools needed in the teaching of mathematics with STEM comprise cardboard or construction paper, Styrofoam, glue, wood, scissors, ruler, straws, spaghetti, marshmallow, rubber bands, sew, hammers, and measuring devices. Likewise, electronic materials needed in STEM classroom comprises calculators, laptops, projectors, robotics kits, and other materials for designing which makes the students a better understanding of technology and engineering design challenges (Stohlmann et al., 2012).

### **Objectives of the Study**

The purpose of this research was to provide information for designing STEM learning activities. Specifically, the study has the following objectives:

- I. To Investigate the change in the response of Basic secondary school students' interest before and after using STEM learning activities in their mathematics classroom;
- II. To find out if gender has any significant effect on the student's interest before using STEM learning activities in their mathematics classroom,
- III. To find out if gender has any significant effect on the student's interest after using STEM learning activities in their mathematics classroom.

### **Research Questions**

This study was guided by the following research questions, based on the research objectives in carrying out the study:

- I. Is there any significant change in the response of Basic secondary school students' interest before and after using STEM learning activities in their mathematics classroom?
- II. Does gender have any significant effect on the student's interest before using STEM learning activities in their mathematics classroom?
- III. Does gender have any significant effect on the student's interest after using STEM learning activities in their mathematics classroom?

### **Methodology**

#### ***Research Design***

The research design employed in this study is a one-group experimental design with pre-test and post-test. In this design, the pre-test survey was conducted at the beginning of the STEM learning activities to determine the prior knowledge of the participants before



conducting the intervention. Then after the intervention, the same instrument for the Post-test was administered to the participants to determine their interest towards STEM learning activities. A visual representation of the design of this study is shown in Table 1 below.

**Table 2: One-group Pre-test and Post-test Design**

Pre-test	Intervention	Post-test
O <sub>1</sub>	X	O <sub>2</sub>

Where, O<sub>1</sub> indicates the Pre-test, X is the intervention and O<sub>2</sub> indicated Post-test.

***Participants of the Study***

The participants of this study were purposively chosen from one of the science intact classes of forty students (26 Male and 14 Female) in upper basic secondary school during Mathematics period in the class. The age of the students ranges between 14-17 years.

***Evaluation of Students’ STEM Learning Activity***

In evaluating the students’ STEM learning activities, a questionnaire developed by the researchers titled STEM Activity Evaluation Questionnaire (STEMAEQ) was submitted for comments and suggestions to check the content coverage, wording, and general editorial exercise of the instruments. The data were collected using the same questionnaire before and after STEM activities based on 3 Likert scales. After the expert’s validation, the reliability index of 0.83 was obtained using Cronbach’s alpha. There are 8 items in the questionnaire and it was distributed during the STEM learning activities.

***Data Analysis***

The data obtained were analyzed using descriptive statistics to describe the views of the participants about their interest in the activities conducted.

**Results**

**Table 3:** Is there any Significant Change in the Response of Basic Secondary School Students’ Interest Before and After using STEM Learning Activities in their Mathematics Classroom

Group	N	Mean	Std. Deviation	Median	p-value	Decision
<b>Before</b>	40	1.44	0.26	1.56	0.000	Rejected
<b>After</b>	40	2.71	0.26	2.75		

$\alpha = 0.05$  level of significance

Table 2 the result of the Wilcoxon signed rank test indicates a mean of 1.44 and median of 1.56 describing student interest before using STEM learning activities in a Mathematics classroom and also a mean of 2.71 and median of 2.75 describing students’ interest after using STEM learning activities in Mathematics classroom with a calculated p-value of 0.000 which is less than 0.05 level of significance. This indicated that there is a significant change in the response of Basic Secondary School students’ interest before and after using STEM learning activities in their Mathematics Classroom.

**Table 4:** Does gender have any significant effect on the students’ interest before using STEM learning activities in their Mathematics classroom?

Gender	N	Mean	Std. Deviation	Median	p-value	Decision
Boys	26	1.46	0.26	1.62	0.477	Retained
Girls	14	1.41	0.27	1.50		

$\alpha = 0.05$  level of significance

Table 4 the result of the Wilcoxon signed rank test indicates a mean of 1.46 and a median of 1.62 describing Boys students’ interest before using STEM learning activities in Mathematics classrooms and a also mean of 1.41 and a median of 1.50 describing Girls students’ interest before using STEM learning activities in Mathematics classroom with a p-value of 0.477 which is greater than 0.05 level of significant. This indicated that Gender does not have any significant effect on the students’ interest before using STEM learning activities in their Mathematics classroom.

**Table 5:** Does gender have any significant effect on the students’ interest after using STEM learning activities in their Mathematics classroom?

Gender	N	Mean	Std. Deviation	Median	p-value	Decision
Boys	26	2.69	0.28	2.75	0.904	Retained
Girls	14	2.74	0.24	2.75		

$\alpha = 0.05$  level of significance

Table 5 the result of the Wilcoxon signed rank test indicates a mean of 2.69 and median of 2.75 describing Boys students’ interest after using STEM learning activities in Mathematics classrooms and a mean of 2.74 and a median of 2.75 describing Girls students’ interest after using STEM learning activities in Mathematics classroom with p-value of 0.904 which is greater than 0.05 level of significance. This indicated that Gender does not have any significant effect on the student’s interest after using STEM learning activities in their Mathematics classroom.

## Discussion

The result of this study indicated that there is a significant change in the response of Basic Secondary School students’ interest before and after using STEM learning activities in their Mathematics Classroom. This clearly shows that STEM learning activities in Mathematics Classrooms enhance students’ interest. And this finding is in line with that of Galadima (2023), who found that STEM learning activities develop pre-service teachers’ interest towards STEM activities. In addition, STEM activities allow the learners to focus on big ideas that are interrelated between the STEM subjects, make STEM experience more fun and provide opportunities for the learners to have necessary skills in hands-on challenges (Ibid). Consequently, Galadima (2023); Galadima et al. (2019b); Hiğde and Aktamış (2022) affirmed that STEM activities improve the attention, and interest of the learners in mathematics classroom.

The result also indicated that Gender does not have any significant effect on the student’s interest before using STEM learning activities in their Mathematics classrooms. Likewise, gender does not have any significant effect on the student’s interest after using STEM learning activities in their Mathematics classroom. That means STEM learning activities in Mathematics classroom improve both male and female students’ interest. That is why

many researchers concluded that the practice of teaching mathematics with a STEM approach involves preparing materials and tools for students to explore and solve a real-world problem through designing, expressing, testing, and revising their ideas (Galadima, 2023; Milaturrahmah et al., 2017; Stohlmann et al., 2012).

## References

- Abdioglu, C., Çevik, M., & Kosar, H. (2021). Investigating STEM Awareness of University Teacher Educators. *European Journal of STEM Education*, 6(1), 1-18. doi:<https://doi.org/10.20897/ejsteme/9559>
- Akçay Malçok, B., & Ceylan, R. (2022). The effects of STEM activities on the problem-solving skills of 6-year-old preschool children. *European Early Childhood Education Research Journal*, 30(3), 423-436.
- Binji, B., Hassan, M. N., Aliyu, B. S., & Galadima, U. (2022). Investigating Attitude of Hearing-Impairment Students Towards Learning Multiplication among Lower Basic Students in A. A. Raji Special School Sokoto, Sokoto State, Nigeria. *Rima International Journal of Education*, 1(1), 119-125.
- Buber, A., & Unal Coban, G. (2023). STEM project-based activity: bio-efficacy of microalgae. *Science Activities*, 1-19.
- Daher, W., & Shahbari, J. A. (2020). Design of STEM activities: Experiences and perceptions of prospective secondary school teachers. *International Journal of Emerging Technologies in Learning (iJET)*, 15(4), 112-128.
- Dan, Z. S., & Gary, W. K. (2018). *Teachers' perceptions of professional development in integrated STEM education in primary schools*. Paper presented at the 2018 IEEE Global Engineering Education Conference (EDUCON).
- Dilek, H., TAŞDEMİR, A., Konca, A. S., & Baltacı, S. (2020). Preschool children's science motivation and process skills during inquiry-based STEM activities. *Journal of Education in Science Environment and Health*, 6(2), 92-104.
- English, L. D. (2016). STEM education K-12: Perspectives on integration. *International Journal of STEM Education*, 3(1), 1-8.
- English, L. D., & King, D. (2019). STEM integration in sixth grade: designing and constructing paper bridges. *International Journal of Science and Mathematics Education*, 17(5), 863-884.
- Fredricks, J. A., Wang, M.-T., Linn, J. S., Hofkens, T. L., Sung, H., Parr, A., & Allerton, J. (2016). Using qualitative methods to develop a survey measure of math and science engagement. *Learning and Instruction*, 43, 5-15.
- Frydenberg, M., Yates, D., & Kukesh, J. (2018). Sprint, then Fly: Teaching Agile Methodologies with Paper Airplanes. *Information Systems Education Journal*, 16(5), 22.
- Galadima, U. (2020). *Pedagogical Content Knowledge of Pre-service Mathematics Teachers in an Integrated Science, Technology, Engineering, and Mathematics*

- Course in Sokoto State, Nigeria. (Unpublished Doctoral Thesis), Universiti Teknologi Malaysia, Johor.
- Galadima, U. (2023). Design and Development of Integrated STEM Teaching Module for Pre-service Teachers in Nigeria. *Journal of Science, Technology and Mathematics Pedagogy*, 1(1), 268-277.
- Galadima, U., Ismail, Z., & Ismail, N. (2019a). A need analysis for developing integrated STEM course training module for pre-service mathematics teachers. *International Journal of Engineering and Advanced Technology (IJEAT)*, 8(5C), 47-52.
- Galadima, U., Ismail, Z., & Ismail, N. (2019b). A preliminary study for the need of developing integrated stem course training module. *Asia Proceedings of Social Sciences*, 4(3), 62-65.
- Gazibeyoglu, T., & Aydin, A. (2019). The effect of STEM-based activities on 7th grade students' academic achievement in force and energy unit and students' opinions about these activities. *Universal Journal of Educational Research*, 7(5), 1275-1285.
- Hassan, M. N., Abdullah, A. H., & Ismail, N. (2020). Effects of VH-iSTEM Learning Strategy on Basic Secondary School Students' Degree of Acquisition of van Hiele Levels of Thinking in Sokoto State, Nigeria. *Universal Journal of Educational Research*, 8(9), 4213-4223.
- Hassan, M. N., Abdullah, A. H., & Ismail, N. (2023). Rethinking Strategy on Developing Students' Levels of Geometric Thinking in Sokoto State, Nigeria. *International Journal of Evaluation and Research in Education*, 12(1), 444-450. doi:10.11591/ijere.v12i1.23531
- Hiğde, E., & Aktamış, H. (2022). The effects of STEM activities on students' STEM career interests, motivation, science process skills, science achievement and views. *Thinking Skills and Creativity*, 43, 101000.
- Kahraman, E., & Doğan, A. (2020). Opinions of middle school students about STEM activities. *Anatolian Journal of Teacher*, 4(1), 1-20.
- Karakaya, F., Akpınar, A., Alabas, Z. E., & Yılmaz, M. (2020). Determination of Middle School Students' Views about STEM Activities. *International Online Journal of Education and Teaching*, 7(2), 537-551.
- Milaturrahmah, N., Mardiyana, & Pramudya, I. (2017). *Science, technology, engineering, mathematics (STEM) as mathematics learning approach in 21st century*. Paper presented at the AIP Conference Proceedings.
- Morrison, S. J., & Bartlett, R. (2009). STEM as curriculum. *Education Week*, 23, 28-31.
- Nadelson, L. S., & Seifert, A. L. (2017). Integrated STEM defined: Contexts, challenges, and the future. *The Journal of Educational Research*, 110(3), 221-223. doi:10.1080/00220671.2017.1289775

- National Research Council. (2011). *Successful K-12 STEM education: Identifying effective approaches in science, technology, engineering, and mathematics*. Washington, DC: National Academies Press.
- Okpala, P. N. (2012). *Reforms In Science, Technology, Engineering And Mathematics (Stem) Education*. Paper presented at the Keynote Address 54th Science Teachers Association of Nigeria (STAN).
- Pekbay, C. (2022). A sample STEM activity based on the engineering design process: A study on prospective preschool teachers' views. *Participatory Educational Research, 10*(1), 86-105.
- Shahali, M. H. E., Halim, L., Rasul, M. S., Osman, K., & Zulkifeli, M. A. (2016). STEM learning through engineering design: Impact on middle secondary students' interest towards STEM. *EURASIA Journal of Mathematics, Science and Technology Education, 13*(5), 1189-1211. doi:10.12973/eurasia.2017.00667a
- Silk, E. M., Higashi, R., Shoop, R., & Schunn, C. D. (2010). Designing technology activities that teach mathematics. *The Technology Teacher, 69*(4), 21-27.
- Siregar, N. C., Rosli, R., & Nite, S. (2023). Students' interest in Science, Technology, Engineering, and Mathematics (STEM) based on parental education and gender factors. *International Electronic Journal of Mathematics Education, 18*(2), em0736.
- Sivaraj, R., Ellis, J., & Roehrig, G. (2019). *Conceptualizing the T in STEM: A Systematic Review*. Paper presented at the Society for Information Technology & Teacher Education International Conference.
- Skinner, E., Saxton, E., Currie, C., & Shusterman, G. (2017). A motivational account of the undergraduate experience in science: brief measures of students' self-system appraisals, engagement in coursework, and identity as a scientist. *International Journal of Science Education, 39*(17), 2433-2459.
- Stohlmann, M., Moore, T., & Roehrig, G. (2012). Considerations for teaching integrated STEM education. *Journal of Pre-College Engineering Education Research, 2*(1), 28-34. doi:Doi.org/105703/1288284314653
- Stohlmann, M., Moore, T. J., & Cramer, K. (2013). Preservice elementary teachers' mathematical content knowledge from an integrated STEM modelling activity. *Journal of Mathematical Modelling and Application, 1*(8), 18-31.
- Struyf, A., De Loof, H., Boeve-de Pauw, J., & Van Petegem, P. (2019). Students' engagement in different STEM learning environments: integrated STEM education as promising practice? *International Journal of Science Education, 41*(10), 1387-1407.
- Thibaut, L., Ceuppens, S., De Loof, H., De Meester, J., Goovaerts, L., Struyf, A., . . . De Cock, M. (2018). Integrated STEM education: A systematic review of instructional practices in secondary education. *European Journal of STEM Education, 3*(1), 1-12.

Yalçın, V., & Erden, Ş. (2021). The effect of STEM activities prepared according to the design thinking model on preschool children's creativity and problem-solving skills. *Thinking Skills and Creativity*, 41, 100864.

Yıldırım, B. (2021). Preschool STEM activities: Preschool teachers' preparation and views. *Early Childhood Education Journal*, 49(2), 149-162.



## ARTIFICIAL INTELLIGENCE-INTEGRATED HOLISTIC FRAMEWORK FOR TEACHER EDUCATION TO ENHANCE INSTRUCTIONAL EFFECTIVENESS IN DIVERSE EDUCATIONAL ENVIRONMENTS IN BAYELSA STATE

<sup>1\*</sup> Anselem Anayochukwu Anih & <sup>2</sup> Bartholomew Oluchi Ukeh

<sup>1&2</sup> Department of Science Education,  
Faculty of Education,  
Federal University Otuoke, Bayelsa State  
Email: [anihaa@fuotuo.ke.edu.ng](mailto:anihaa@fuotuo.ke.edu.ng)<sup>1</sup> & [ukehbo@fuotuo.ke.edu.ng](mailto:ukehbo@fuotuo.ke.edu.ng)<sup>2</sup>

---

### Abstract

*This research examined the roles of an AI-Integrated Holistic Framework for teacher education to enhance instructional effectiveness in diverse educational environments in Bayelsa State. The study was guided by two research questions and two null hypotheses. Descriptive survey research design with a mixed-methods approach was adopted for the study. The population consisted of 1055 respondents, including teacher educators and final year students, from four institutions that offer Teacher Education programmes in Bayelsa State. A sample size of 284 was chosen using a simple random sampling technique. Data were collected through a structured questionnaire, titled “AI-Integrated Holistic Framework for Teacher Education Questionnaire (AIHFTE)”. The instrument was validated by three research experts. Reliability of the instrument was determined using Cronbach alpha statistic which yielded 0.82 and 0.84 for clusters 1 and 2 with an overall reliability index of 0.83. The research questions were answered using mean and standard deviation, while Analysis of Variance (ANOVA) was used to test the null hypotheses at 0.05 alpha level. The findings of the study showed that AI-Integrated Holistic Framework played a significant role for teacher education in the enhancement of instructional effectiveness in diverse educational environments in Bayelsa State. In view of the findings, the researchers recommended that there is need in leveraging the framework, implementing comprehensive training programmes, and fostering collaborative efforts among stakeholders. While acknowledging the existence of challenges, the study underscores the dynamic nature of integrating educational technology and emphasizes the importance of strategic and collaborative endeavors for the successful integration of AI into teacher education in Bayelsa.*

**Keywords:** Artificial Intelligence, Holistic Framework, Teacher Education, Instructional Effectiveness, Diverse Educational Environments

### Introduction

In the heart of Nigeria, the landscape of education is both rich with potential and challenged by various factors, and education, being a fundamental pillar of societal development, constantly grapples with the challenge of meeting the evolving needs of diverse student populations. The advent of Artificial Intelligence (AI) has emerged as a promising avenue to revolutionize traditional teaching methodologies and address the complexities faced by educators in diverse educational settings (Jones & Martinez, 2019).

As we delve into the study of an "AI-Integrated Holistic Framework for Teacher Education Enhancing Instructional Effectiveness in Diverse Educational Environments in Bayelsa State," it is imperative to understand the nuanced intersection of Artificial Intelligence (AI), teacher education, and the diverse educational settings prevalent in the region.

The term "AI-Integrated Holistic Framework" is comprehensive approach in teacher education that seamlessly integrates Artificial Intelligence into the entire spectrum of training, bridging the gap between theory and practice (Brown et al., 2021). This framework envisions a symbiotic relationship between AI technologies, pedagogical theories, and practical teaching skills, aiming to enhance the overall effectiveness of instructional strategies. This framework aims to synergize traditional teaching methodologies with advanced AI technologies, creating a cohesive and interconnected system that addresses various aspects of teacher education.

Traditional teacher education models before now, often struggle to address the dynamic challenges of modern classrooms. These struggles ranges from struggle to keep pace with evolving educational theories, research, and best practices, Lack of extensive hands-on classroom experience can leave teachers unprepared for the challenges of real-world teaching. Challenges of addressing the diverse needs of students and promoting cultural competence among teachers, as well as the challenges in attracting and retaining high-quality candidates into the teaching profession, include the necessity for ongoing professional development, the creation of inclusive curricula, the provision of adequate support and resources for teachers, and the implementation of policies that make the teaching profession more appealing and sustainable. All the listed above leaves teachers ill-equipped for modern classrooms leading to a gap between educational demands and teacher preparedness, which ultimately impacts student learning outcomes and the overall effectiveness of the education system (Zeichner, Payne & Brayko, 2015).

Modern classroom represents a paradigm shift in education, emphasizing dynamic, learner-centered approaches that leverage technology, collaboration, and flexible teaching methodologies. This transformation aims to prepare students for the complexities of the 21st century by integrating innovative practices and adapting to the diverse needs of today's learners. The diverse needs of today learner include the following, integration of innovative teaching methods, technology, and flexible learning environments. A shift of focus from the teacher to the student, allowing for personalized and self-directed learning, can enhance student engagement and motivation, cater to individual learning styles, and promote deeper understanding and retention of knowledge. That is a departure from traditional teacher-centric models; modern classrooms prioritize student-centered learning. This approach emphasizes personalized instruction, self-directed exploration, and critical thinking, empowering students to take an active role in their education. However without the integration of AI, educators may encounter difficulties in adapting to these diverse learning needs, keeping pace with technological advancements, and effectively bridging the gap between theoretical knowledge and practical application (Johnson, 2018).

The integration of Artificial Intelligence (AI) into teacher education is a transformative endeavor that promises to reshape the landscape of pedagogy. This concept envisions a synergistic relationship between AI technologies and teacher training programs, fostering a new generation of educators equipped with advanced tools and methodologies. Also teachers can leverage AI analytics to make informed decisions based on real-time student



performance data, enabling targeted interventions and support (Siemens & Long, 2011). Again, AI-powered assessment tools provide timely and accurate evaluations, reducing the administrative burden on educators and allowing for more focused instructional planning (Baker, 2017). And enable the adaptation of teaching strategies in response to student progress, ensuring that instruction remains dynamic and responsive to evolving educational needs (Dede, 2017). Not all, AI supports the creation of innovative and engaging curricula by identifying trends in educational content and recommending updates or enhancements (Wiley, 2017). Above all, AI can offer personalized professional development opportunities for teachers, addressing specific areas of growth and keeping educators abreast of the latest pedagogical advancements (O'Byrne et al., 2018).

In order to ensure a meaningful and relevant teacher education programme, it is important to consider the integration of an AI-Integrated Holistic Framework. This framework represents a comprehensive approach to teacher education, which combines the power of Artificial Intelligence with a holistic view of teaching methodologies. It is essential to seek out this framework for a robust teacher education program that seamlessly blends various elements together. When we refer to the term "holistic" in this context, we are highlighting an inclusive strategy that incorporates theory, practical application, and AI-driven insights. This integration is crucial as it aims to optimize instructional effectiveness and provide teachers with a well-rounded understanding of their profession.

It, therefore, becomes of utmost significance that a comprehensive and integrated framework, incorporating Artificial Intelligence, is thoroughly investigated and analyzed for the purpose of enhancing the effectiveness of instructional methods in diverse educational settings within the state of Bayelsa. This imperative stems from the unique and distinctive characteristics associated with the aforementioned region, most notably the prevalent issue of flooding. As stated by Osaji (2022), the detrimental impact of floods in Bayelsa is far-reaching, affecting not only agricultural lands but also crucial infrastructures such as educational institutions, healthcare facilities, and various other amenities. The consequences of this natural disaster extend to approximately 300 communities spread across the eight Local Government Areas within the state. Furthermore, an independent research study conducted by Endurance, Ogbangain and Jack (2014), revealed a concerning aspect of the educational landscape in Bayelsa, namely the inadequate attention and substandard allocation of resources by government bodies towards the development of rural education. This neglect has resulted in poor quality human and material resources within the rural education sector. In addition to these factors, Bayelsa has been selected as a focal point of this investigation due to the presence of five universities and one college of Education within its boundaries. Notably, these tertiary institutions are divided among different governing bodies, with one being under federal jurisdiction, three under state control, and one being privately owned (Olusegun, 2012).

It, thus, emerges as a matter of utmost significance that a Holistic Framework for Teacher Education, seamlessly integrated with AI, be thoroughly examined in order to optimize instructional efficacy in diverse educational settings in a state like Bayelsa. This imperative stems from the distinctiveness characterizing Bayelsa, including the prevalence of flooding. According to Osaji's research (2022), a considerable number of agricultural lands, educational edifices, healthcare facilities, and other vital infrastructures suffered the consequences of this inundation. Moreover, the flood detrimentally impacted around 300 communities across all eight LGAs in the state. In addition to the flooding

predicament, a separate investigation conducted by Endurance, Ogbangain and Jack (2014), brought to light the fact that governmental educational policies in Bayelsa neglect the development of the rural education sector.

Regrettably, the provision of educational resources, both human and material, to rural areas remains inadequate and uncared for. Furthermore, Bayelsa warrants attention due to its diverse educational landscape, housing five universities and one college of education. Among these institutions, one is federally owned, three are under state jurisdiction, and one operates as a private entity (Olusegun, 2012). Hence the reason for this study titled *AI-Integrated Holistic Framework for Teacher Education to Enhance Instructional Effectiveness in Diverse Educational Environments in Bayelsa State, Nigeria*.

### **Statement of Problem**

Despite the recognition of AI as transformative in education, there is a gap in understanding how to implement an AI-Integrated Holistic Framework in Bayelsa State. Teacher education needs to integrate AI seamlessly and address the needs of diverse educational contexts in the area. The lack of understanding hinders the development of an effective AI framework tailored to the local educational landscape. The problem can be divided into key components: **Integration Challenges:** Investigating obstacles and complexities in integrating AI into the teacher education framework in Ogbia LGA. **Alignment of Theory and Practice:** Exploring the disconnect between theoretical knowledge and practical application in diverse classroom settings, and how AI can bridge this gap. **Adaptation to Diverse Educational Environments:** Understanding the nuances of diverse educational environments in Bayelsa State and tailoring the AI framework accordingly. **Impact on Instructional Effectiveness:** Evaluating the impact of the AI framework on instructional effectiveness and student engagement in Bayelsa State. This research aims to address these issues and develop an effective AI framework for teacher education in Bayelsa State, enhancing instructional practices in diverse educational environments.

### **Objectives of the Study**

Generally, the main objective of this study was to assess the impact of an AI-Integrated holistic framework on the teacher education enhance instructional effectiveness in diverse educational environments in Bayelsa State. Specifically, the study sought to:-

- I. assess the extent to which the alignment of theoretical knowledge, practical teaching skills, and AI technologies will contribute to the overall enhancement of teacher education programs in Bayelsa State.
- II. evaluate the impact of integrating an AI-Integrated Holistic Framework on the instructional strategies of teacher educators in diverse educational environments within Bayelsa State.

### **Research Questions**

The following research questions guided the study:

- I. To what extent does the combination of theoretical knowledge, teaching skills, and AI technologies improve teacher education programs in Bayelsa State?

- II. What are the effects of using an AI-Integrated Holistic Framework in the teaching methods of teacher educators in different educational environments in Bayelsa State?

### **Hypotheses**

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

Ho1: There is no significant difference in instructional effectiveness of traditional teacher education models and the AI-Integrated Holistic Framework in diverse educational settings in Bayelsa.

Ho2: There is no significant correlation between the traditional teacher education models and the AI-Integrated Holistic Framework aligned theoretical knowledge, practical teaching skills for teacher education in Bayelsa.

### **Methodology**

This study utilized a descriptive survey research design, which combined qualitative and quantitative approaches in order to gain a comprehensive understanding of the impact of the AI-Integrated Holistic Framework on teacher education in Bayelsa. Bayelsa State consists of eight Local Government Areas, five notable tertiary institutions, one federal, three state, and one private institution. However, among these institutions, only four house a faculty of education. The population of the study consisted of 1055 individuals, including teacher educators and final year students, from these four institutions offering Teacher Education programmes. A simple random sampling technique was employed to select teacher education institutions, educators, and students within Bayelsa. The sample size was determined based on the identified institutions and the availability of participants who were willing to take part in the study. Out of the four institutions, two were randomly selected without replacement. From the population of 568 individuals, a sample size of 284, which represented 50% of the population, was used for the study.

The instrument used for data collection was the researchers' Structured Questionnaire titled "Quantitative Assessment of Perceived Impact of the AI-Integrated Holistic Framework on Instructional Effectiveness" (QAPIAHFIE). This questionnaire was designed to measure the extent to which the AI-Integrated Holistic Framework aligned with instructional effectiveness in teacher education in Bayelsa. The questionnaire utilized a four-point rating scale, ranging from Very Great Extent (VGE - 4 points), Great Extent (GE - 3 points), Low Extent (LE - 2 points), and Very Low Extent (VLE - 1 point). The instrument underwent face and content validity by three experts, two from the Department of Robotics and Computer Education at the University of Nigerian Nsukka and one from the Measurement and Evaluation unit of the Science Education Department, Federal University Otuoke, and Bayelsa State. The instrument was validated by three research experts. Reliability of the instrument was determined using Cronbach alpha statistic which yielded 0.82 and 0.84 for clusters 1 and 2 with an overall reliability index of 0.82. Out of the 284 copies of questionnaire distributed, 262 were returned representing 92.25% of the sample sizes. The collected data were analyzed using mean and standard deviation. Analysis of Variance (ANOVA) was employed to test the null hypotheses at a significance level of 0.05. The decision-making process was based on a criterion of 2.50. Mean scores of 2.50 and above were considered to indicate a great extent, while scores below 2.50 were considered to indicate a low extent.

## Result

Research Question 1: To what extent does the combination of theoretical knowledge, teaching skills, and AI technologies improve teacher education programs in Bayelsa State?

**Table 1:** Summary of the mean rating provided by teacher educators regarding the Extent to which the Alignment of theoretical knowledge, practical teaching skills, and AI technologies will contribute to the overall improvement of teacher education programs in Bayelsa State

S/N	The alignment of theoretical knowledge, practical teaching skills, and AI-Integration Holistic framework in Bayelsa State will:	X	SD	Rmk
1.	Enable more cohesive teacher education in Bayelsa State	3.00	.82	GE
2.	Enhance an effective teacher education in Bayelsa State	2.97	.76	GE
3.	increase practical teaching skills, in of teacher educator	3.00	.84	GE
4.	Encourage enrollment of students into teacher education programmes	2.92	.80	GE
5.	improve the attitude of students in Institutions of teacher education positively	2.99	.84	GE
6.	Easy the work load of teacher educators	2.99	.79	GE
7.	make learning process within diverse educational environment more learner centered	3.02	.84	GE
8.	Encourage government to enforce the total adoption in teacher education in programmes	3.05	.83	GE
<b>Grand Mean</b>		<b>2.99</b>	<b>.82</b>	<b>GE</b>

The table indicates that teacher educators in Bayelsa State generally agree that aligning theoretical knowledge, practical teaching skills, and AI technologies will significantly enhance teacher education programs. The mean ratings, which range from 2.92 to 3.05, with a grand mean of 2.99, reflect a Great Extent (GE) on the positive impact of this alignment. The highest mean rating of 3.05 suggests that educators strongly believe that such alignment will encourage government enforcement of AI integration in teacher education. The results highlight a consensus on the benefits of integrating these elements to improve teacher education in Bayelsa State.

**Research Question 2:** What are the effects of using an AI-Integrated Holistic Framework in the teaching methods of teacher educators in different educational environments in Bayelsa State?

**Table 2:** Summary of the mean ratings provided by teacher educators the effects of using an AI-Integrated Holistic Framework in the teaching methods of teacher educators in different educational environments in Bayelsa State

S/N	The integration of the AI-Integrated Holistic Framework in teacher education in Bayelsa State will:	x	SD	Rmk
9.	Influence positively instructional strategies for diverse learning needs	3.00	.81	GE
10.	Ensure the customization of instructional strategies to cater for diverse learning needs?	3.01	.85	GE

11.	Increase effectiveness of instructional strategies.	3.02	.80	GE
12.	Will have less challenges in the full implementation	3.00	.81	GE
13	Create more job opportunities for teacher education outside Bayelsa State.	2.93	.79	GE
<b>Grand Mean</b>		<b>2.99</b>	<b>.81</b>	<b>GE</b>

Table 2 summarizes the mean ratings provided by teacher educators on the effects of using an AI-Integrated Holistic Framework in their teaching methods across various educational environments in Bayelsa State. The ratings indicate that the framework positively influences instructional strategies for diverse learning needs (Mean = 3.00, SD = 0.81) and ensures customization to cater to these needs (Mean = 3.01, SD = 0.85). It also increases the effectiveness of instructional strategies (Mean = 3.02, SD = 0.80) and faces fewer challenges in full implementation (Mean = 3.00, SD = 0.81). Additionally, the framework creates more job opportunities for teacher education outside Bayelsa State, although this effect is slightly lower (Mean = 2.93, SD = 0.79). The overall grand mean rating is 2.99 with a standard deviation of 0.81, indicating a generally Great Extent (GE).

**Hypotheses 1:** There is no significant difference in instructional effectiveness of traditional teacher education models and the AI-Integrated Holistic Framework in diverse educational settings in Bayelsa.

**Table 3:** Independent t-test value of the responses of teacher educator on instructional effectiveness of traditional teacher education models and the AI-Integrated Holistic Framework in diverse educational settings in Bayelsa

Group	n	$\bar{x}$	SD	df	P-value	Decision
<b>Teacher educators</b>	284	2.99	.82	283	1.10	Reject Ho

Table 3 presents the results of an independent t-test comparing the instructional effectiveness of traditional teacher education models and the AI-Integrated Holistic Framework in diverse educational settings in Bayelsa. With a mean score of 2.99 and a standard deviation of 0.82 for the responses from 284 teacher educators, the p-value of 1.10 leads to rejection of the null hypothesis (Ho), indicating a significant difference in instructional effectiveness between the two models. Therefore, the AI-Integrated Holistic Framework is perceived as more effective compared to traditional models.

**Hypotheses 2:** There is no significant correlation between the traditional teacher education models and the AI-Integrated Holistic Framework aligned theoretical knowledge, practical teaching skills for teacher education in Bayelsa

**Table 4:** Independent t-test value of the responses of teacher educator on instructional effectiveness of traditional teacher education models and the AI-Integrated Holistic Framework in diverse educational settings in Bayelsa

Group	n	$\bar{x}$	SD	df	P-value	Decision
Teacher Educator	284	2.99	.81	283	1.15	Reject Ho

Table 4 shows the independent t-test results for the correlation between traditional teacher education models and the AI-Integrated Holistic Framework regarding theoretical knowledge and practical teaching skills in Bayelsa. With a mean score of 2.99 and a standard deviation of 0.81 for 284 teacher educators, the p-value of 1.15 leads to the rejection of the null hypothesis (Ho), indicating a significant correlation between the two models. This implies that the AI-Integrated Holistic Framework aligns well with both theoretical knowledge and practical teaching skills compared to traditional models.

### Discussions

The findings of the study showed that the AI-Integrated Holistic Framework played a significant role in enhancing instructional effectiveness for teacher education in diverse educational environments in Bayelsa State. This framework facilitated personalized learning experiences, allowing teachers to tailor their instruction to meet the unique needs of each student. Additionally, it provided real-time feedback and data analytics, enabling educators to make informed decisions and adjustments to their teaching strategies. The use of AI technology also fostered greater student engagement and motivation, as interactive and adaptive learning tools were incorporated into the classroom. The implementation of this framework significantly improved the quality of education and teaching outcomes in Bayelsa State.

The study conducted by Endurance, Ogbangain, and Jack (2014) supports the notion that AI-Integrated Holistic Frameworks can markedly improve instructional effectiveness within various educational settings. Their research highlights how integrating artificial intelligence into educational frameworks enhances teaching methodologies and learning outcomes across diverse environments. By leveraging AI technologies, educators can tailor instructional approaches to meet the specific needs of students, thereby fostering a more adaptive and effective learning experience. These findings underscore the transformative potential of AI in enhancing teacher education and instructional practices in contemporary educational environments.

### Conclusion

The study initially highlights challenges in achieving AI integration in teacher education in Bayelsa State, the subsequent improvement in perceived effectiveness of instruction with AI integration holds promise. These findings underscored the dynamic nature of implementing educational technology and underline the need for strategic and collaborative efforts to ensure the successful integration of AI into the holistic framework for teacher education in diverse educational settings.



## **Recommendation**

In view of the findings of the study, the following recommendations were proffered:

- I. To ensure long-term success, future iterations of the AI-Integrated Holistic Framework should leverage insights gained from the identified challenges. The provision of comprehensive training programs, establishment of support structures, and cultivation of an innovative culture can play a crucial role in overcoming initial resistance and facilitating successful integration of AI.
- II. The research underscores the significance of collaborative endeavors among educational stakeholders. Engaging educators, administrators, and policymakers in the decision-making process can foster a shared vision for the integration of AI, thereby nurturing a sense of ownership and dedication among stakeholders.

## **References**

- Baker, R. S. (2017). Educational data mining and learning analytics: Applications to constructionist research. *Technology, Knowledge and Learning*, 22(1), 1-18.
- Cochran-Smith, M., & Zeichner, K. M. (2005). *Studying teacher education: The report of the AERA Panel on Research and Teacher Education*. Lawrence Erlbaum Associates.
- Dede, C. (2017). Roles and skills for teachers in next-generation learning systems. *Journal of Digital Learning in Teacher Education*, 33(1), 6-10.
- Endurance U, Ogbanga M, and Jack J (2014). Government education policies and rural educational Development: A Study of Yenagoa L.G.A, Bayelsa State. *International Journal of Humanities and Social Science Invention*, 3(7), 31-38. ISSN (Online): 2319-7722, ISSN (Print): 2319-7714.
- Jones, A., & Martinez, M. (2019). AI in education: The present and future. *Educational Research Review*, 28, 100293.
- Johnson, C. (2018). Bridging the theory-practice gap in education through AI integration. *Journal of Teacher Education*, 39(4), 532-545.
- O'Byrne, I. W., Weller, P., & Wild, J. (2018). Research on professional development and teacher change: Implications for pre-service teacher education. In J. M. Pedder, S. P. Edwards, S. B. Martin, & R. O'Byrne (Eds.), *Affect and Cognition in Pre-service Teacher Development* (pp. 113-128). Springer.
- Olusegun F (2012), List of Universities in Bayelsa State Nigeria. <https://www.myschoolgist.com/ng/universities-in-bayelsa-state>
- Osaji, S. (2022). Bayelsa flood impacted 1.3m persons 96 die — SEMA. <https://punchng.com/Bayelsa-flood-impacted-1.3m-persons-96-die-SEMA>
- Siemens, G., & Long, P. (2011). Penetrating the Fog: Analytics in Learning and Education. *EDUCAUSE Review*, 46(5), 30-32.
- Wiley, D. (2017). After the MOOCs. *Information Standards Quarterly*, 25(2), 50-56.

Zeichner, K., Payne, K. A., & Brayko, K. (2015). Democratizing knowledge in university-based teacher education programs. *Teaching and Teacher Education*, 47, 198-208.



## ASSESSING UNDERGRADUATES' ATTITUDE TO AND ACADEMIC ENGAGEMENT IN COMPUTER-BASED TEST COURSES IN NIGERIAN UNIVERSITIES

<sup>1\*</sup>Muhinat Bolanle Bello & <sup>2</sup>Iyanuoluwa Grace Oyedepo

<sup>1&2</sup>Department of Social Sciences Education

Faculty of Education

University of Ilorin

Email: [bello.mb@unilorin.edu.ng](mailto:bello.mb@unilorin.edu.ng)

Orcid ID: <https://orcid.org/0000-0001-5181-7908>

---

### Abstract

*Academic engagement and attitude are required for a successful classroom teaching and learning process. Successful teaching and achievement come with assessment which takes different forms, it could be through Computer-Based Tests or Paper Pencil Tests. When it is a Computer-based test, students' attitudes and level of academic engagement become questionable. That was why the study investigated Lecturers' and Students' assessments of undergraduates' attitudes and academic engagement toward courses examined through computer-based tests, in a Nigerian University. Four research questions were raised and answered. The study adopted descriptive survey research. The population for this study comprised all students and lecturers at the University of Ilorin. The target population is 300 level students' of the Sampled University. Also, 365 students and 102 lecturers made a total of 467 respondents which were sampled through a multistage sampling technique. Eight out of 16 faculties were sampled using a purposive sampling technique. A 4-point Likert-scale researchers' designed questionnaire on attitude and a two-point scale for academic engagement titled "Lecturers' and Students' Assessment of Undergraduates' Academic Engagement and Attitude towards Computer-Based Test Courses in a Nigerian University", were used to elicit the needed data for the study. With psychometric properties of content validity and a reliability index of 0.79. The data collected were analyzed using descriptive statistics. Frequency count, percentage and mean were used to answer the research questions. Findings revealed that the lecturer's assessment of the student's attitude is low while the student's assessment of attitude is high. Both Lecturers and Students assessed undergraduate's level of academic engagement toward courses examined through Computer-based tests as low. Based on the findings of the study, it was recommended that the lecturer should make the teaching-learning process activities based on always motivating students' attitudes positively regardless of the mode of examining them.*

**Keywords:** Attitudes, Computer-Based Test, Lecturers, academic, and engagement

### Introduction

Education helps to bring about positive change in the attitude and behaviour of the learner. The process of learning starts from the womb and continues when the child is born till death. The first institution of learning that a child is exposed to is the family and

from there, the school takes over to continue the teaching and learning formally while the child takes on the position of being a student till graduation. Acquiring knowledge involves many steps both from the teacher and the student. Formal education has taken a giant stride in accomplishing the goal of making each learner useful to himself and able to add value to society at large. For a learner to attain this goal, there are a series of educational activities that must take place within the formal school system such as teaching and learning, and evaluation of students through the writing of tests and examinations which leads to promotion to the next level or repetition of the same academic level until the student gets qualified. However, student's participation in teaching and learning is important as no effective learning can take place if they are passive or not available in the class, meaning they should be academically engaged.

Engagement in the classroom is crucial for a successful educational experience. It entails participating fully in class and making a commitment to studying the subject matter outside of the classroom. Participating in class discussions, asking questions, and finishing homework are all examples of showing engagement. Participating in extracurricular activities like student clubs and organizations or doing community service are additional ways to display it (O'Donoghue, 2015). Students who participate in academic activities are better able to absorb and comprehend the course information as well as develop crucial abilities like cooperation, problem-solving, and critical thinking. A sense of community and connection to the campus can be fostered by participation in academic activities. Students who participate in extracurricular activities might make friends, form connections, and find their purpose in life (Dahlin et al., 2018). It can also improve academic achievement because more engaged students typically achieve better grades, have better attendance, and feel more accomplished (O'Donoghue, 2015). Engagement in academic activities is an important part of the higher institution learning experience, and students need to stay actively engaged to get the most out of their education.

Tertiary Education in Nigeria is subdivided into three categories, which are Colleges of Education, Polytechnics and Universities (Salami, 2021). Undergraduates from Nigeria usually display more developed personality traits and more well-defined aspirations about their attitude toward academic participation. Students at universities have greater autonomy because they have more possibilities for engagement and can pick and choose which classes to take. A successful undergraduate possesses the following traits: self-control, punctuality, active participation in scheduled classes, intelligence, the capacity to learn, study skills, and organizational and self-regulatory abilities (Matoskova, 2015). Meanwhile, undergraduates face numerous distractions while pursuing their education; as a result, they frequently fail to fully commit to their studies, which is the main goal. Their level of academic engagement will determine how well perform in their examination.

Examinations have always been a crucial component of formal education since they verify a student's understanding of the material. Examining someone or a group's knowledge, comprehension, or skills concerning a given topic or subject is a process called examination (Salami 2021). This evaluation may be conducted through tests, quizzes, oral interviews, or other assessment methods (Smith, 2017). This could also be a test administered using paper and pencil or a computer. Students are exposed to writing and submitting in a paper-and-pencil test, or physical papers are given for the questions, and answer sheets are presented for submission after the assessment within the designated period. According to Karthikeyan (2021), paper and pencil assessment refers to traditional student assessment formats such as written tests and also standardised tests that

ask students to use pencils to fill in bubbles on a scan-able answer sheet. The scripts are collected from the students, compiled together, and marked manually for scoring. Participants must read the questions on a paper and pencil test before writing or highlighting their answers. Being a test in which the questions are given to the pupils and they must write or shade the correct answers on answer sheets. It is expected that students will arrive at the exam site equipped with their writing supplies (Makinde, 2021). In classroom assessments, students are typically required to provide written solutions on paper because standardized tests are increasingly frequently given on computers. In comparison to computer-based assessment, which is carried out using a computer device, a category of information and communication technology, and is intended to measure deeper understanding through skills and ability, paper-and-pencil assessment is frequently used in the classroom to refer to tests scored objectively. These tests are meant to measure memorized knowledge and less advanced forms of understanding (He & Lao, 2018).

Information and communication technology (ICT) refers to a broad range of communication tools and media, including radio, television, mobile phones, computer networks, satellite systems, etc., as well as the numerous services and applications they enable, such as video conferencing and distance learning (Azor, 2017). ICT has become a common feature of daily life. The entire world has become a global village where communication is essential for everyday life. ICT's widespread use and quick progress have changed society from the information technology age to the knowledge age, also known as the millennial society, which digitizes information (text), images, sound, motion, and other forms (Obioma, Junaidu, & Ajagun, 2016). Additionally, since technology has permeated several facets of human life, including education, it has significantly altered a variety of human activities. It has become essential that various educational activities can be carried out utilizing the new technology ICT following the introduction of Information and communication technology (ICT). However, the recent push toward globalization has elevated information and communication technology to a crucial position in modern life. Almost every aspect of human society has been impacted by ICT, including the medical, social, economic, and educational spheres. Nations' educational systems have undergone significant transformation as a result of the recent integration of ICT. ICT can therefore be considered a change agent in the field of education. (Richard & Edna, 2019).

Communication and information in the educational system, technology resources are used for a variety of tasks such as student administration and registration (Ajinaja, 2017); serving as an instructor and learner facilitator (Azor, 2017); assessment of learning through Computer Based Test (Joshua, 2018) and even record keeping and management of resources in the education sector (Ghavifekr, Afshari, Siraj & Segar, 2013). According to Adegbija, Fakomogbon and Daramola (2012), technology has been the only thing that has made the education of nations reliable, efficient and globally based with its role in computer-based assessment being more significant. The computer-based test represents a modern way of answering an examination question, placed side by side in written Pen And Paper (PNP) format. It is possible to think of CBT as a complex of artificial techniques and knowledge for resolving the instructor's problem involving the marking pen and exam. CBT is a combination of networks, hardware, and software as well as methods of communication, collaboration, and engagement that enable the processing, management, and exchange of data, information, and knowledge (Bennett, 2015). Thus, computer-based examination helps the instructor to assess the students with convenience irrespective of the population as the computer marks the scripts with the programmed answers and gives each student's scores at the end of the assessment.

An increasingly common type of assessment utilized in many educational contexts is the computer-based test. CBT consists of assignments or questions that are given and graded by a computer-based system. The technology makes it possible to offer assessment information, automatically score responses, and monitor student achievement. Additionally, computer-based tests decrease the time and expense involved in marking exams (Fries & Doorlag, 2019). Chalmers (2016) cited by Bandele and Olatunji (2019), asserted that computer-based tests are tests that can be used in a supervised or non-supervised environment, and can allow students to check their progress through self-assessment. It can also be used for testing lower-order skills (such as knowledge, understanding and application); it can also be used for testing higher-order skills to improve the students' analysis. In addition, computer-based tests are simple to develop and can be used to give exams to undergraduate students at various levels, providing more accurate and quick responses than paper-based tests in situations when the population is huge (Smith, 2017). Higher education institutions, particularly the University of Ilorin, have embraced computer-based testing as one of their assessment methods since organizations like JAMB provide qualifying tests to millions of applicants. CBT other than the University of Ilorin, the National Open University, the University of Nigeria, Nsukka, and others also use computer-based tests to administer exams to students to lighten the workload caused by the high student population. Technology integration into educational programs is now possible, but for this to work and produce the desired results, students must be actively involved throughout their academic career and their attitude towards it is one of the important tools that determines if the impact of technology would produce the expected result.

Student attitudes regarding computer-based test courses can be both good and negative. It is appropriate to state that attitude is a significant precursor to action. A person's attitude toward an object, problem, circumstance, or abstract entity can be used to forecast, regulate, and influence that person's behaviour. Attitudes are established by experience, and both internal and external circumstances have the potential to change them. A crucial factor in the learning process is a person's attitude (Adeyinka & Bashorun, 2012).

An individual's attitude is an emotional tendency that might be favourable or negative. In contrast to kids who learn using traditional methods, students who use mobile devices for learning adopt positive attitudes regarding it. Even if writing exams using computer-based tests is probably simple for them, there are still some procedures they must go through to write exams or tests. Their approach to this process is crucial to attaining the course's objective, which is evaluated through a computer-based test (Salami, 2021).

Adewole (2021), remarked that attitude is considered to be individualistic, an abstract entity and a kind of intervening variable imposed to explain irregularities in behavioural responses. Students work harder, are more engaged, and perform better when they perceive utility value, which suggests that they have a positive attitude about learning. However, if they are not interested in learning, they will stop participating in the learning that is required of them and instead concentrate on their grades since the course will be evaluated using a computer-based test. However, a student's attitude can be positive or negative depending on how they view building learning habits in a classroom setting, which can also impact how engaged they are in their academic work.

Academic engagement is a multifaceted notion that is defined as the student's commitment to academic activities in terms of time, effort, and motivation (Shah & Barkas, 2018). Kuh (2010), cited by Alrashidi et al (2016), defined academic engagement

as the energy and time a student devotes to educational sound activities outside and inside classrooms, and practices and policies that educational institutions use to encourage the student to participate in these activities. Multimedia in the classroom provides significant pedagogical benefits in terms of encouraging higher student participation. This has also been shown in the context of online learning, which has increased student academic engagement and decreased the core issues of learner isolation and dropout using a variety of platforms including Zoom, Google Classroom, etc. (Nepal & Rogerson, 2020). However, the usage of computer-based exams, one of the many strategies that encourage students to actively interact with their topic has increased as a result of efforts to involve students through more tests, assignments, or examinations. It enables computer processing of marking, instant feedback, the recording of student scores, and the analysis of student performance, which lessens the workload on teachers. In a Computer-Based test hall, students are actively engaged in answering the questions given within the allotted time, therefore, distractions are minimized and the expected effort is given to the assessment process.

Academic engagement includes consistent attendance, completion of assignments, preparedness for class, and participation in class and school activities, which contribute to students' ability to adhere to rules and regulations, qualify them to write examinations and keep them actively engaged in learning. However, when the reverse is the case among undergraduate whose goal is to read on their own to pass the examination, all that it takes to get them engaged academically would be wasted. In line with the current discussion, assessment of undergraduate academic engagement and attitude towards Computer-Based Test courses is important to reduce possible associated problems in higher institutions. Based on the discussion, it is pertinent to note that a study like this is amply justified and research-worthy.

### **Problem Statement**

In many academic institutions, the trend of students' declining class attendance is a problem. Students' motivation is influenced by a variety of elements, which in turn encourage them to attend classes, finish their assignments, participate fully in class and school events, and show up to class mentally and physically prepared. It is obvious that students retain more information when they actively participate in class, and increased attendance at lectures also helps students learn the material more effectively, particularly when teaching strategies like active learning and learner-centred instruction are used. As a result, it is crucial to evaluate the undergraduate's degree of academic engagement and attitude in the courses assessed using computer-based tests, which are an essential component of teaching and learning in the modern higher education setting of the twenty-first century. Undergraduate academic engagement in higher institutions has drastically reduced as several processes take place before the learning objective is achieved. School performs both manifest and latent functions i.e. obvious and hidden functions respectively. However, the latent function of the school which is expected to bring about an expected positive outcome in learners, especially the ones that occur in the classroom during teaching and learning has given rise to serious questions and concerns. Students need total attention in any teaching and learning process, by attending almost all lessons until the attendance and every class task or activity is adhered to, and at the end, the examination is given. All these have practically been disapproved of or have not been given high priority in today's class or lessons taken among undergraduates. Some find it difficult to even know and identify their course lecturers as all they are after is to register for the course, buy textbooks to read on their own and meet for continuous assessment



and examination. What happened to all the initial teaching-learning academic engagement is the concern of this study.

Undergraduate students have the freedom to come to class or not, but some rules guide the school activities and teaching and learning before students are qualified to write exams such as the availability of 75% of attendance. It is very discouraging seeing lecturers in class and not up to one-third of registered students are physically present either online or physically in the four walls of a classroom to learn after the lecturer has put in so much effort in preparing for the lectures as their manifest role; students find it unnecessary to attend lectures due to reasons best known to them. For instance, a GNS class of 14,000 registered students where only 120 students are present in class or a class of 500 registered students and just less than 300 students are actively engaged in the class activities, calls for alarm on what is happening to academic engagement. The lecturers are charged with the responsibility of teaching, taking of student's attendance in class, and conducting their assessments with enthusiasm to ensure student's progress in their academics and a positive change in behaviour at the end of every academic session but all these measures have not been able to produce the desired and expected change in student's academic engagement, especially towards courses examined through Computer-Based Test.

Similarly, Kim et al (2019), examined the role of academic engagement and digital readiness in students' achievements in university e-learning environments and one of the findings revealed that student's e-learning adoption and attitudes in the university context and academic achievements are mediated by digital readiness and academic engagement.

Lastly, the study of Sengsouliya et.al (2020), investigated predictors of student academic engagement and the findings show that the student participants rate is on a high level of engagement in all dimensions. That means they perceived that they are well engaged in learning across three types of engagement: Emotional, Behavioral, and Cognitive engagement. However, looking at the mean scores, two dimensions of Emotional and Behavioral engagement are found to be scored highest of all. However, even when many studies have been conducted on students' attitudes towards computer-based tests, no study is available to the best of the researcher's knowledge that combined lecturers' and students' assessments of undergraduates' level of academic engagement towards courses examined through Computer-Based Test. Hence, this necessitated the study of lecturers' and students' assessment of undergraduate academic engagement and attitudes towards Computer-Based Test Courses, in a Nigerian University, which is considered complementary to existing studies.

### **Objectives of the Study**

The study investigated Lecturers' and students' assessment of undergraduate academic engagement and attitudes towards Computer-Based Test Courses, in a Nigerian University. Specifically, the study evaluates.

- I. Lecturers' assessment of undergraduates' attitudes towards courses examined through computer-based Tests.
- II. Students' assessment of undergraduates' attitudes towards courses examined through computer-based Tests.

- III. Lecturers' assessment of undergraduates' level of academic engagement towards courses examined through Computer-Based Test.
- IV. Students' assessment of undergraduates' level of academic engagement towards courses examined through Computer-Based Test.

### **Research Questions**

The following research questions were generated to guide this study;

- I. How do Lecturers assess undergraduates' attitudes towards courses examined through computer-based Tests?
- II. How do Students assess undergraduates' attitudes towards courses examined through computer-based Tests?
- III. How do Lecturers assess undergraduates' level of academic engagement towards courses examined through a Computer-Based Test?
- IV. How do students assess undergraduates' level of academic engagement towards courses examined through a Computer-Based Test?

### **Methodology**

The study employs a descriptive research design of the survey type. The data collected were analyzed using descriptive statistics. Percentage and mean were used to answer the research questions raised. The population for this study comprised all lecturers and students of the University of Ilorin, Ilorin, Nigeria. Multi-stage sampling procedure was used for this study. At stage one, the purposive sampling technique was used to select only one university which is the University of Ilorin out of the Eight universities in Kwara State. In stage two, simple-random sampling was adopted to sample only (8) faculties, which are the faculty of Education, Agriculture, Arts, Physical Sciences, Communication and Environmental Sciences, Engineering, Environmental Science, and Law. At Stage Three, the students were stratified based on academic level, and 300 Level students were purposively sampled. They were considered appropriate for this study because they have had prior experience on courses examined through computer-based tests for not less than two sessions.

There are 5,872 300 level students in the following ratio: Education (2,745), Arts (479), Agriculture (748), Physical Sciences (350), Communication and Information Sciences (500), Engineering (400), Environmental Sciences (400), and Law (250), out of which 365 were sampled. This is in line with the research advisor (2006) who stated that 365 is suitable for a total population of 5,000-7,500 at a confidence level of 95% and 5.0% margin of error. Lastly, a simple random sampling procedure was adopted in selecting the students that constituted the sample.

On the part of lecturers, a simple random sampling procedure was adopted in the selection of 102 lecturers across the faculties to make a total of 467 respondents

The instrument for this study was a researcher's designed questionnaire titled "Lecturers and Students Assessment of Undergraduate's Academic Engagement and Attitude towards Computer-Based Test Courses in a Nigerian University" (LSAUAEACTCNU)", which consisted of two sections for both lecturers and students. The sections in the

questionnaire were made to address the research questions raised. Section A contained the demographic data of the respondents; section B contained 10 items on attitude; respondents were to indicate one option out of four options, of Strongly Agree, Agree, Disagree and Strongly Disagree, while section C contained 19 items on level of academic engagement with each items having two options of Yes and No.

## Results

The findings of this study were presented by the purpose of the study. The analyzed data were collected through a researchers’ designed questionnaire, which was analyzed with the use of descriptive statistics in the following order:

Four research questions were raised and answered in the study. Research questions 1 and 2 were answered with a 4-point Likert scale. 1.0 is the lowest mean and 4 is the highest mean. The mean range of 1-2.54 is regarded as negative and 2.55 - 4.00 as positive. Research questions 3 and 4 were answered with a two-point scale with 1 being the lowest frequency while 3 is the highest. The frequency range of 1 - 1.54 is considered low and 1.55 – 3.00 is considered high.

**Research Question One:** How do lecturers assess undergraduates’ attitudes towards courses examined through computer-based Tests?

**Table 1:** Lecturers’ Assessment of Undergraduates’ Attitude towards Computer-Based Test Courses

STATEMENTS	N	Mean	Remark
Adopting a Computer-based mode of examining my course allows me to adopt a variety of teaching /learning styles	102	2.85	Positive
The convenience of examining through CBT promotes the willingness to attend such courses.	102	3.19	Positive
Students prefer attending classes of courses examined through computer-based Test	102	2.28	Negative
I feel that writing of assignment for a computer-based test is flexible for students	102	2.33	Negative
I think computer-based test courses accurately reflect student’s true ability to participate in class and school activities	102	1.80	Negative
Students’ learning speed and level of preparedness for class are improved in courses examined through computer-based.	102	2.00	Negative
I have observed that courses examined through Computer-based tests allow me to be in charge of their learning	102	3.33	Positive
Students feel motivated to complete my assignments on computer-based test courses	102	2.00	Negative



Students always arrive early with enthusiasm for computer-based test classes	102	1.90	Negative
Students prefer to raise questions and participate in discussions in a computer-based test class	102	2.33	Negative
<b>Weighted mean</b>		<b>2.40</b>	<b>Negative</b>

**Key:** Negative = 1.00 - 2.50    Positive = 2.60 - 4.00

Table 1 shows the attitude of lecturers toward undergraduates attitude towards courses examined through the computer-based Test platform. It reveals at a benchmark of 2.50 that the attitude of students assessed by lecturers was positive. The weighted mean of 2.40 is a confirmation of the negative attitude of students assessed by Lecturers. Therefore, the attitude of lecturers on their assessment of students' attitudes towards courses examined through the Computer-Based Test is negative, since their 2.40 falls below the benchmark of 1.00-2.50.

**Research Question Two:** How do students assess undergraduate attitudes towards courses examined through a computer-based Test?

**Table 2:** Students' Assessment of Undergraduates' Attitude towards Computer-Based Test Courses

STATEMENTS	N	Mean	Remark
Courses examined through CBT make it easy to understand the subject matter	365	3.12	Positive
I find it easy to navigate and choose the correct answer even with prior knowledge of the course contents	365	3.13	Positive
Computer-based courses offer flexibility in terms of when and where I can study.	365	3.07	Positive
I feel motivated to actively participate in discussions and assignments in computer-based courses	365	3.07	Positive
I feel motivated to attend courses examined through CBT regularly	365	2.98	Positive
I believe courses examined through CBT require a similar level of effort as traditional testing mode.	365	3.03	Positive
I am comfortable seeking help or clarification from instructors in computer-based courses	365	2.97	Positive
Courses examined through CBT are also considered self-motivated courses that do not require the presence of teachers and students in face-to-face class teaching.	365	2.90	Positive
Courses examined through CBT are more convenient in terms of teaching /learning	365	2.92	Positive

Performance in a course examined through CBT is 365 2.73 Positive  
 always better than PPT even with students with less  
 attendance

**Benchmark** **2.99** **Positive**

**Key:** Negative = 1.00 – 2.50 Positive = 2.60 – 4.00

Table 2 shows the assessment of students’ undergraduate attitudes towards courses examined through the Computer-Based Test platform. It reveals at a benchmark of 2.50 that the attitude of the students was positive on all the presented items without any exemption. The weighted mean of 2.99 is a numeric indicator that the attitude of the students towards courses examined through the Computer-Based Test is positive.

**Research Question Three:** What is the Lecturers’ assessment of undergraduate’s level of academic engagement towards courses examined through a Computer-Based Test?

**Table 3:** Lecturers’ Assessment of the level of Undergraduate Level of Academic Engagement towards CBT Examined Courses

Levels	Frequency	Per cent
Low	73	71.4
High	29	28.6
<b>Total</b>	<b>102</b>	<b>100.0</b>

**Key:** Low = 1 - 1.54 High = 1.55 – 3

Table 3 shows lecturers’ assessment of undergraduate’s level of academic engagement towards courses examined through Computer-Based Tests in a Nigerian University as low at 71.4%.

**Research Question Four:** What is students’ assessment of undergraduate’s level of academic engagement towards courses examined through a Computer-Based Test in a Nigerian University?

**Table 4:** Students’ Assessment of the level of Undergraduate Level of Academic Engagement towards CBT Examined Courses

Levels	Frequency	Per cent
Low	231	63.4
High	134	36.6
<b>Total</b>	<b>365</b>	<b>100.0</b>

**Key:** Low = 1 - 1.54 High = 1.55 – 3

Table 4 revealed that students assessed their level of academic engagement in a Nigerian University as low at 63.4%.

## Discussions

The first finding of this study shows that lecturers’ assessment of undergraduate’s attitudes towards courses examined through computer-based tests is negative. This could be because students do not attend classes that are examined through CBT and this could be due to the availability of instructional text. Students feel they can easily read on their own to prepare for examinations without having to attend classes. Also, since the questions are constructed in an objective format, they can easily choose answers.

Another reason why undergraduates have a negative attitude towards courses examined through computer-based tests could be because assignments are not given for courses

examined through CBT, due to the large population of students that attend the course. Majorly, most of the courses are either faculty courses or general courses, which are taught by different lecturers who are assigned to teach different topics from the curriculum contents. Therefore, given of assignment and collation of scores might not be feasible.

Low attendance in class is another reason for the negative attitude observed by their lecturers. When students are not enthusiastic to attend classes, it can lead to low attendance. Also, attendance is not taken even though there is a rule of 75% attendance before students would be allowed to write examinations, but since there is no documented attendance given due to the large class, students do not feel motivated to attend classes. This could also lead to little or no participation in group discussions or presentations. This is in contrast with the study of Erdogdu (2019), whose study revealed that there is a positive relationship between attitude toward learning, school engagement and academic achievement. As is expected, school engagement plays a mediating role in the relationship between attitude toward learning and academic achievement. Furthermore, when the attitude toward learning is positive, individuals are more academically successful, and when academic achievement is high, positive emotions toward school engagement have a mediating role. However, lecturers are unable to influence students' attitudes positively which has drastically led to low academic engagement towards courses examined through Computer-Based tests.

The findings of this study also revealed that Students assessed their attitude as positive. This may be because they believe they can access information concerning the course without class attendance. It could also be because they are mostly Education students and they believe that their courses are easy to read and understand, which involved less practical. However, since they can easily understand the subject matter, their primary goal would be to read and prepare for the examination, not minding the adequate process of learning and internalization of the subject matter.

Computer-based test courses offer flexibility in terms of where and when they can study. Unlike courses that are examined through paper and pencil test format where the lecturer can call for an impromptu test at any time of the teaching and learning process. The fear of failing would push them to read ahead of class in case of any unannounced test or discussion in class. The computer-based test needs to be programmed and scheduled for students to know when to converge at the CBT centre to write their test or examination. Therefore, they have the freedom to study when the examination timetable is released since instructional texts are available. This also made them believe that courses examined through CBT require a similar level of effort as a traditional testing mode in terms of preparation for tests and examinations.

Undergraduates' attitudes are also positive because they can easily form discussion groups among themselves even if they do not attend classes or have face-to-face learning with their instructors. This study group would assist them to prepare ahead of the examination, those that attend classes would share their notes and teach their colleagues what they've learnt in their previous lesson. This can be a form of positive advantage for them when it is a course examined through computer-based tests. This finding is in line with that of Bandele and Olatunji (2019), whose finding showed that students' attitude to the Computer-Based Test for General Studies examination was positive and the objectives of general studies using computer-based tests were achieved and effectively implemented. In the same vein, Muhammad et al (2020) findings indicated that the students have a strong

and positive attitude in a learning management system (LMS) environment. The result is possibly because the students are positive and support the implementation of e-learning and they feel e-learning can improve their learning activities. There is a positive attitude toward the LMS environment, and this is probably due to their feeling that using LMS is a better learning approach in a higher learning institution.

Furthermore, findings also revealed that Lecturers' assessment of undergraduate's level of academic engagement towards courses examined through Computer-Based Tests in a Nigerian University is low. Lecturers are trained to engage their students in all learning activities but when the students are not available to learn, it leads to low participation in class and school activities, little or low preparedness for class, lack of completion of assignments, and inconsistency in class attendance especially towards courses examined through computer-based test and negative attitude would lead to low academic engagement. It was confirmed that Students considered attending Classes for CBT courses a waste of time and group discussions are more vital to students than attending classes when it is a CBT form of examination. Since the classes are always large, keeping 75% attendance is a scam since it is a CBT mode of examination. Students also find it difficult to read ahead of the class in preparation for the next lecture when instructional texts are made available; meanwhile, reading ahead of the class would enhance viable discussion of the subject matter and ask important questions on what was not well understood while preparing for the class ahead. This finding is in line with the finding of Abdull (2014), on the relationship between Lecturers' teaching style and students' academic engagement and it was found that the relationship between teaching style does not determine students' academic engagement. If there is no relationship between teaching style and academic engagement, then attitude has a lot to do with students' level of academic engagement. In the findings of Eunice and Joseph (2013) on student levels of engagement in learning: A case study of Cape Peninsula University of Technology, lecturers reported that students had low levels of engagement in learning, felt that the students had lacked dedication, knowledge of what is required of them in tertiary education, the skills to study and to apply knowledge, focus, and time management skills. The nonengaged students were seen as immature and as having been forced to take up a course of study by their parents.

Lastly, the finding of the study revealed that students' assessment of undergraduate's level of academic engagement is on the negative side. However, academic engagement is subdivided into four variables in this study, which are consistent class attendance, completion of assignments, preparedness for class and participation in class and school activities. In terms of low academic engagement through little or no attendance to class on courses examined through computer-based tests, students affirmed that they need half lessons to pass the exams given to them and attending two hours of class is not always necessary for courses examined through CBT, all they need is one hour class. When they are not available in class, class and school activities will not be achieved as planned by the instructor. Also, students do not work with their colleagues to complete a task or an assignment in Computer-Based test courses, since Computer-Based test courses do not always require assignments and not all lecturers give assignments on the courses. Meanwhile, giving assignments would spur them to do personal research by making good use of e-facilities provided for them in the school. It would be difficult for students who do not have access to personal computers, or good phones or are financially buoyant to buy data for online research to back up their responses to the assignment given. A large number of the students affirmed that note-taking is one of the class activities that stimulate active participation in class activities but the unavailability of students in the

class would not make this take place. When students write down personal notes in class, they will be able to express their understanding of the subject matter in writing. It would also serve as additional text material while revising or reading for their exams apart from the instructional texts given in school. This finding is in line with the findings of Adewole (2021), who studied Class attendance and academic performance in Banking and Finance Courses: Cross-level comparison revealed that students with 75% and above attendance performed remarkably better than students with less than 75% attendance, suggesting that the policy on 75% minimum class attendance contributes to higher academic performance. It was therefore suggested that Class attendance in the conventional manner should be encouraged and regulated, while the virtual learning system is being worked upon to be a perfect substitute for the regular class system. However, the findings of Ishola and Benedict (2021) found that Computer-Based Test influences undergraduate students' lecture attendance regardless of their course of study and suggested that an enabling environment that will motivate and gear students toward making lectures a priority should be provided in schools.

## **Conclusion**

The study concluded that lecturers viewed the attitude of students as negative while students assessed theirs as positive. Both the lecturer's and students' assessments of their academic engagement were low. The evidence showed that when students lack a positive attitude towards their studies, they are less likely to actively engage with their academic tasks, leading to potential negative consequences for their educational outcomes. The low attitude of students would drastically reduce their academic engagement in the teaching and learning process. It is therefore possible for students to view their attitude as positive when they think that the goal is to have high grades in the course.

## **Recommendations**

Based on the findings, the following recommendations are made:

- I. As a result of the study's finding that undergraduates have negative attitudes towards courses examined through computer-based tests as assessed by their lecturers. Therefore, it is advised that learning activities should include elements that encourage students to adopt a positive outlook. To accommodate varied learning styles, lecturers might use a variety of teaching techniques, such as group exercises, case studies, and real-world examples. They can also help students understand what is expected of them by offering clear course objectives, expectations, and grading criteria. Last but not least, lecturers can promote candid dialogue and active engagement by establishing a judgment-free environment for queries and conversations.
- II. By participating in all the events that their professors and school have arranged for them, students should actively demonstrate a positive attitude about their course of study. They would be able to maximize their learning as a result. The establishment of both short- and long-term educational goals that are both obvious and attainable can help students stay motivated. They should use digital tools, planners, and calendars to stay organized as well. Keeping track of tasks, due dates, and study plans can help students focus and feel less stressed. Finally, they should recognize and appreciate successes, no matter how minor they may appear to be. Motivation can be increased through positive reinforcement.



- III. It was revealed that the lecturer's assessment of student's academic engagement is low, it is therefore recommended that learning should be more learner-centered. They need to take an active part in both teaching and learning. Peer study groups should be developed, for instance, so that students can share knowledge and ask questions about the course material. In turn, this will motivate them to work together on group tasks. Regardless of how big the class may be, attendance should be required and count toward their evaluation. As a result, they will become more actively involved in studying and school activities.
- IV. Students should become more involved in the teaching and learning process by actively using learning strategies such as active participation in class, developing note-taking skills to capture important information during lectures, asking questions during lectures, and utilizing educational technology and online resources to improve their learning experience. High levels of academic engagement would result from this.

## References

- Abdull, K. (2014). Relationship between lecturers' teaching style and students' academic engagement. *Journal of Educational Research and Studies*, 2(1), 12-20.
- Adegbija, M. V., Fakomogbon, M. A., & Daramola, F. J. (2012). The role of technology in quality education. *Journal of Information Engineering and Applications*, 2(6), 48-54.
- Adeyinka, T., & Bashorun, M. T. (2012). *Instructional technology for teaching and learning*. LAP Lambert Academic Publishing.
- Adewole, O. S. (2021). *Attitude towards learning*. In *Encyclopedia of Education and Learning Sciences* (pp. 1-7). CRC Press.
- Adewole, O. S. (2021). Class attendance and academic performance in Banking and Finance Courses: Cross-Level comparison. *Journal of Higher Education*, 9(2), 45-57.
- Ajinaja, O. O. (2017). ICT in education: Its impacts and challenges. *Journal of Educational and Social Research*, 7(3), 47-53.
- Akpan, I. G. (2008). Information and communication technology (ICT) and educational management information system (EMIS) in Nigeria. *Global Journal of Educational Research*, 7(1), 53-60.
- Alrashidi, O., Phan, H. P., & Ngu, B. H. (2016). Promoting student engagement: The role of instructional factors and teacher involvement practices. *Journal of Educational Research*, 109(6), 668-680.
- Azor, H. N. (2017). The role of technology in teaching and learning. *Journal of Education and Practice*, 8(4), 51-58.
- Bandele, A., & Olatunji, M. O. (2019). The effect of computer-based tests on students' academic performance in biology. *The International Journal of Management Science and Business Administration*, 5(2), 1-8.

- Bennett, R. E. (2015). *Technology for educational assessment*. Routledge.
- Dahlin, M., Martinez, J., & Engelhard, G. (2018). Impact of extracurricular activities on students. *Education Policy Analysis Archives*, 26(6), 1-19.
- Erdogdu, M. (2019). Attitude toward learning, school engagement and academic achievement. *Journal of Educational Psychology*, 25(2), 67-82.
- Eunice, P., & Joseph, L. (2013). Student levels of engagement in learning: A case study of Cape Peninsula University of Technology. *Journal of Higher Education and Educational Planning*, 6(4), 23-35.
- Fries, C. J., & Doorlag, D. H. (2019). *Teaching and learning with technology*. Pearson.
- Ghavifekr, S., Afshari, M., Siraj, S., & Segar, R. (2013). ICT integration in education: Incorporation for teaching and learning improvement. *International Journal of Emerging Technologies in Learning*, 8(4), 20-25.
- He, W., & Lao, J. (2018). Using technology in the classroom to enhance teaching and learning. *Educational Technology & Society*, 21(4), 381-393.
- Ishola, A. F., & Benedict, O. (2021). Influence of Computer-Based Test on undergraduate students' lecture attendance. *Journal of Educational Technology*, 7(1), 112-124.
- Joshua, A. (2018). Computer-based test and assessment in educational measurement. *Journal of Education and Practice*, 9(3), 10-18.
- Karthikeyan, V. (2021). Paper and pencil test vs. online assessment: A comparative study. *Journal of Education and Learning*, 10(1), 97-108.
- Makinde, O. T. (2021). Examination malpractice in Nigeria: Causes, effects and solutions. *Journal of Educational Sciences and Practice*, 5(2), 102-112.
- Matoskova, K. (2015). The role of personality traits and competencies in predicting university academic achievement. *Journal of Education and Learning*, 4(2), 184-195.
- Muhammad, A. R., et al. (2020). Students' attitude in a learning management system (LMS) environment. *Journal of Educational Technology and Learning*, 12(3), 45-57.
- Nepal, K., & Rogerson, J. (2020). Online learning engagement during the COVID-19 pandemic: An exploratory study in a post-secondary education institution. *Journal of Research in Innovative Teaching & Learning*, 13(2), 147-163.
- Obioma, G., Junaidu, S. A., & Ajagun, G. (2016). The role of ICT in educational leadership and management. *International Journal of Academic Research in Progressive Education and Development*, 5(4), 158-166.
- O'Donoghue, J. (2015). Engagement in the classroom: The roles of pupil characteristics, social interaction, and teacher influences. *Educational Psychology*, 35(1), 65-85.
- Research Advisor (2006). Sample size calculator. Retrieved from

- Richard, O. A., & Edna, A. C. (2019). The impact of information and communication technology (ICT) in education. *Journal of Education and Practice*, 10(10), 114-120.
- Salami, B. K. (2021). The influence of computer-based test on students' learning outcomes in Nigerian universities. *Journal of Educational Technology*, 5(1), 46-54.
- Shah, M., & Barkas, L. A. (2018). Academic engagement and student experience. *Innovations in Education and Teaching International*, 55(4), 411-421.
- Smith, A. R. (2017). Assessment strategies: Computer-based testing. In *Handbook of Research on Learning Outcomes and Opportunities in the Digital Age* (pp. 217-234). IGI Global.



## ASSESSMENT OF METALWORK INSTRUCTIONAL MATERIALS FOR DESIGN THINKING IMPLEMENTATION AS INNOVATIVE APPROACH IN TECHNICAL COLLEGES IN KWARA AND NIGER STATES, NIGERIA

**<sup>1\*</sup>Shefiu Abdulrauf, Aede Hatib Musta'amala Jamal, Muftau Kayode Raji, & Alhassan Ndagi Usman**

<sup>1\*</sup>Metalworks Department,  
School of Technical Education,  
Kwara State College of Education (Technical), Lafiagi.  
Email: [shefiuabdulrauf@utm.my](mailto:shefiuabdulrauf@utm.my)

<sup>2</sup>School of Education,  
Faculty of Social Science and Humanities,  
University Teknologi Malaysia  
Email: [aede@utm.my](mailto:aede@utm.my)

<sup>3</sup>Electical/Electronics Department,  
School of Technical Education, Kwara State College of Education (Technical), Lafiagi.  
Email: [rajimuftaukayode@gmail.com](mailto:rajimuftaukayode@gmail.com)

<sup>4</sup>Department of Technical and Vocational Education,  
Abdulkadir Kure University, Minna  
Email: [algogogius@gmail.com](mailto:algogogius@gmail.com)

---

### **Abstract**

*In an attempt for Nigeria to be on the same page with the global trend in technology, it is imperative to have in place an active and meaningful instructional method like the Design Thinking in order to produce students that can withstand the 21st century industrial and economics demands and to implement this there is need to have required and adequate tools and equipment. It is on this backdrop that this study was carried out to assess metalwork instructional materials for design thinking implementation as innovative approach in technical colleges in Kwara and Niger states, Nigeria. A descriptive research methodology was therefore employed for the study of a population consisting of 45 metal work teachers and heads of departments from 10 technical colleges offering metal work subject in Kwara and Niger states. One research question was postulated to guide the study. Data for the study were collected by means of a structured questionnaire which comprised 51 items. The statistical tools employed for data analysis were frequency and simple percentage. The results revealed that there are quite few equipment and hand tools in the technical colleges under study. Based on the findings of the study, it was recommended among others that both states and federal government should provide for the technical colleges in Nigeria with the required tools and equipment in metalwork to aid easy implementation of design thinking approach for skill acquisition in metalwork trade. By implication, making teaching and learning impactful by the teachers and more practical and be learner-centred for the students.*

**Keywords:** Assessment, Instructional materials, Design thinking, Metalwork, Availability

## **Introduction**

Technical and Vocational Education in the view of Okoye and Okwelle (2013), and Okwelle and Ikedi (2020) advocates for the development of the head (knowledge), training of the hand (dexterity) and enriching the heart (consciousness and painstaking). If TVE is properly managed it will provide saleable skills necessary for gainful employment and self-reliance to technical college graduates (Okwelle & Tambari, 2017; Okwelle and Ikedi 2020). That is why provision of necessary instructional materials that could cater for the needed skills in metalwork subject is important. Hence, funding of the programme needs to be of great concern to the government in order to produce students with high problem-solving skills needed to succeed in the 21st century (Razzouk & Shute, 2012). Shehu and Ibrahim (2014) noted that availability of the resources herald meaningful conclusion in the teaching and learning in technical college.

Technical college is an institution of learning where students acquire both practical and theoretical knowledge in a particular trade. Technical college as described by NPE (2013) is a level of education of 3years duration after the upper basic (JSS 3) and before tertiary levels which provide trained manpower at craft, advance craft and technical levels. The beneficiary of this type of education can as well upon completion secure employment or proceed on further education in tertiary institutions such as polytechnics, colleges of education (technical) and universities. Technical college is an institution designed to train people for work to reflect the modern trends and development in occupations and skills requirement (Ayonmike, 2011). These acquired skills cater for many national challenges such as poverty reduction and unemployment among youths. Thus, technical college has major roles to play in the development of skillful personnel who can solve complex problems as result of acquiring the 21st century skills. Therefore, it is important to assess metalwork instructional materials available for implementing the design thinking in technical colleges as an innovative approach to the teaching and learning.

However, literature revealed that in most of the colleges, teaching is at the mercy of the method or approach employed by the teacher especially in teaching metalwork. Therefore, one important modern tool that has been advocated by scholars is design thinking, an approach which allows for more creative and student-centered approach to teaching and learning (Crites & Rye, 2020).

## **The Design Thinking**

Design thinking is a kind of special method to solve complex (wicked) problems (Rittel, 1972; Buchanan, 1992; & Thoring & Müller, 2011) and to generate innovative solutions, based on a user-centered approach with multi-disciplinary teams (Thoring & Müller, 2011). Sarah (2016) noted that the design thinking ideology asserts that a hand-on, user-centric approach to problem solving can lead to innovation and innovation can lead to differentiation and a competitive advantage. The aim of design thinking is getting to the root of problem be it social or technological, and generate a lasting solution. Design Thinking is one promising way to extend the creative potential of both students and professionals (Lembcke, 2016). It is thus a right peg in the right hole if used in the teaching and learning of metalwork subject in technical colleges in Nigeria. As important as this approach may seem, however, availability of instructional materials is an important prerequisite. The desire in this paper, therefore, is to investigate the availability

of these important instructional materials for the implementation of the design thinking in technical colleges in Nigeria.

Razzouk and Shute (2012) defined design thinking as an analytical and creative process that engages a person in opportunities to experiment, create and prototype models, gather feedback, and redesign. The design thinking revolves around three related process or phases that may be non-sequential and iterative namely; inspiration phase; ideation phase; and implementation phase (Sharief, Nailah, Tania, & Tinashe, 2018). There is no doubt that over the last few decades, the design thinking process has been widely accepted as a method for innovation (Dolata & Schwabe, 2016; Hager & Uflacker, 2016; Wrigley, Mosely & Tomitsch, 2018; Albay & Eisma, 2021). Meanwhile, as design thinking is a simple approach to problem solving, it as well increases the probability of success and breakthrough innovation especially in metalwork subject (Sarah, 2016).

In technical education there is need to look beyond the traditional method of handling the entire process in teaching and learning as technology is fast growing across the globe. As the traditional approaches in teaching may no longer work effectively (Luka, 2014; Albay & Eisma, 2021), educational institutions should endeavor to look for new instructional methodologies of enhancing student learning (Albay, 2019; Retna, 2016; Albay & Eisma, 2021). That is why De Sena, Bento, Matias and Silva (2021) suggested that the methodology of Design Thinking should be explored as a protagonist of the change of focus of the teaching process, focus on the student and their learning process. Therefore, to move in the direction of the globe, novelty is required to be infused into the educational system, particularly in the technical education.

### **Instructional Materials for Teaching Metalwork Technology**

Metalwork is one of the trades that are being offered in technical colleges. Metalwork is the product of metal materials such as arts, articles and objects, or act of making object out of metal (NBTE, 2001). This act includes a corresponding wide range of skills, process and tools. Metalwork department in technical colleges involves welding and fabrication, mechanical engineering craft-practice, equipment mechanic work, foundry craft practice and instrument mechanic work (NABTEB, 2014). The teaching of any technical subject involves both theory and practical, the practical aspect must be carried out with the required tools and equipment for effective delivery of the instructions to the learners. Ogbu (2007) stated that teaching equipment (instructional materials) are some of the most effective devices, which both teachers and students can use to enhance the quality of teaching. This equipment includes all forms of information carriers that can be used for teaching and learning activities.

Metalwork cannot be taught effectively in the classroom only; it must go be accompanied with workshop experience where some skills are demonstrated with instructional materials. Ogunleye (2007) affirmed that implementation of metalwork programme calls for provision of workshop activities for learners, without which its objectives may not be realized. The author further stated that the provision of these activities of course presupposes the availability of the relevant teaching resources. In other words, instructional materials such as workshop space, tools, machines, equipment, facilities and human resources must be readily available for effective learning to take place. Instructional materials help to facilitate teaching and learning and are used to influence concrete and permanent change in technical behaviour (James, 2015).

According to Ogwa (2002) and James (2015), instructional materials include audio visual aids, educational materials such as charts and ICT instructional resources, tools, equipment, and machines. Nwachukwu (2006) stated that instructional materials in vocational and technical education are all the practical and skills developing resources that would facilitate the processes of teaching, learning and evaluation of vocational and technical skills. Therefore, metalwork instructional materials are those materials employed by metalwork teacher to teach the subject effectively, especially in the practical class such as tools and equipment.

Instructional materials could be already made object that can be imported such as tools and equipment. If too expensive then another means should be explored to get it within the environment to suite the purpose. Umunadi (2009) observed that realization of the objectives of technical college programmes, and their ability to improve the student achievement depends on a number of factors. These include the availability of equipment, tools and materials, and adequate supply of technical education teachers, and proper implementation and usage of technical equipment tools and materials. Ogbuanya, Ogundola, and Ogunmilade (2010) noted that the effective preparation of any caliber of students is dependent on the availability of facilities for the training.

Therefore, for effective learning in technical education to take place, there must be connection between the brain and the hand. It is imperative for technical colleges to take into cognizance the availability of necessary tools, equipment and instructional materials to enable them meet the objectives of their establishment particularly in the area of metalwork trade. Students' attitudes towards technical subject can be improved positively when tools and equipment are available in technical colleges (Okwelle & Ikedi, 2020).

### **Availability of Metalwork Instructional Materials**

In a simple term, availability means the quality of being at hand when needed (Vocabulary.com, 2021). It is noted that instructional materials are essential for effective teaching and learning, and should be made available in all schools (Tuimur & Chemwei, 2015). Moreover, provision of metalwork instructional materials is shouldered by the government through the college principal who request for the materials on behalf of the head of department that makes them available to the teachers. Availability here refers to accessibility of the metalwork instructional materials, tools and equipment that one can find, buy or get to make the design thinking implementation in metalwork trade feasible.

### **Assessment of Instructional Materials**

Assessment is an act of evaluating object, method/procedure or programme to know it's worth and effect or impact. Owolabi and Olasehinde (2007) described assessment as a means of quality control to determine the level of accountability displayed by stakeholders in the industry and of determining the effectiveness of teaching and learning, as well as in finding out student achievement. On the other hand, Ryan (2021) also viewed assessment as an ongoing process of gathering, analyzing and reflecting on evidence to make informed and consistent judgements to improve future students learning. Therefore, to ensure that metalwork students acquire the 21st century skills, there is the need for assessing on the spot or available teaching facilities in technical colleges for the implementation of design thinking approach in metalwork trade. Metalwork trade is supposed to be a practical oriented subject that needed to be taught with tools and equipment. To achieve this, Sarah (2016) affirmed that approaching problem-solving with a hands-on, leads to innovation. Hence in this context, assessment

will be referring to finding out the availability of tools and equipment needed to implement design thinking approach in metalwork trade. This is particularly important when we consider the fact that training in technical education must be accompanied with provision of required tools and equipment to facilitate knowledge and skills to the learners in all the trades, metalwork inclusive.

### **Research Question**

The research question that guided the conduct of the research is:

- I. What is the level of availability of instructional materials (equipment) for design thinking implementation in metalwork subject in technical colleges in North-Central Nigeria?
- II. What is the level of availability of instructional materials (hand tools) for design thinking implementation in metalwork subject in technical colleges in North-Central Nigeria?

### **Methodology**

The study was carried out in Technical Colleges offering metalwork subject in Kwara and Niger States, Nigeria. A descriptive survey research was adopted for this study, since the researcher sought for the opinions of the respondents as regards the availability of metalwork instructional materials, as well as employed equipment checklist.

The population for the study comprised of all the 45 metalwork teachers in technical colleges in Kwara and Niger states. Total population sampling technique was employed. Therefore, the entire population was used for the study because it is of manageable size.

The instrument used for data collection were questionnaire and, tools and equipment checklist developed by the researcher. Face to face administration of questionnaire was employed. Frequency and simple percentage were used to analyze the research question. The cutoff percentage for availability of equipment and hand tools was 55%. This implied that any item with 55% and above was regarded as available, while items with less than 55% were considered not available.

### **Results and Discussion**

Data obtained on the level of availability of instructional materials for implementation of design thinking in metalwork subject in technical colleges were presented in Tables 1 and 2.

**Table 1:** Level of Availability of Metalwork Equipment in Technical Colleges

S/N	Item	Required Number	Available %/ Frequency	Not Available% /Frequency	Decision
1	Portable electric hand drilling machine	50	(26) 52	(24) 48	A
2	Drilling machine (sensitive, pillar and radial)	10	(9) 90	(1) 10	A
3	Grinding machine (floor and table type)	20	(12) 60	(8) 40	A
4	Bench and rotary shears	20	(4) 20	(16) 80	N/A
5	Guillotine (electric and foot operated)	20	(0) 0	(20) 100	N/A
6	Circular cutting machine	20	(1) 5	(19) 95	N/A
7	Folding machine	10	(2) 20	(8) 80	N/A
8	Bending rolls (floor and table type)	20	(0) 0	(20) 100	N/A
9	Oxy-acetylene welding equipment	20	(7) 35	(13) 65	N/A
10	Arc welding machine (AC or DC)	20	(9) 45	(11) 55	N/A
11	Electric hand grinders	30	(10)33.3	(20)66.67	N/A
12	Power hacksaw machine	20	(3) 15	(17) 85	N/A
13	Furnace	10	(13) 130	(0) 00	A
14	Soldering stove	100	(19) 19	(81) 81	N/A
15	Soldering bits	200	(50) 25	(150) 75	N/A
16	Spot welding machine with accessories	10	(0)0	(10) 100	N/A
17	Forging equipment	20	(11) 55	(9) 45	A
18	Foundry equipment	20	(5) 25	(15) 75	N/A
19	Shaping machine	20	(3) 15	(17) 85	N/A
20	Milling machine (horizontal and vertical)	10	(1)10	(9) 90	N/A

NB: Figures in parentheses indicate number of equipment.

KEY: “A” Available. “N/A” Not Available

The results of the availability and non-availability of equipment in technical colleges are presented in Table 1. The result showed that out of 20 equipment that were expected to be found in the technical colleges, 17 equipment were available which fall within the range of 5-90% whereas, items 5, 8 and 16 were not available with zero percent. Among the equipment that were available, item 13 was found to be more than what was required with 30% increment over the required number. Items 1, 2, 3, and 17 had respective percentage availability of 90, 60, 55, and 52. All other items had percentage availability that was below 50%. In the entire equipment item 6 ranked the lowest with 5% availability.



**Table 2:** Level of Availability of Metalwork Hand Tools in Technical Colleges

S/N	Item	Required Number	Available %/Frequency	Not Available%/Frequency	Decision
1	Bench vice	300	(61) 20.3	(239) 79.7	N/A
2	Combination square	150	(19) 12.7	(131) 87.3	N/A
3	Centre punch	300	(64) 21.3	(236) 78.7	N/A
4	Spirit level	150	(22) 14.7	(128) 85.3	N/A
5	Protractors	150	(22) 14.7	(128) 85.3	N/A
6	Mallet (assorted)	200	(49) 24.5	(151) 76.5	N/A
7	File (assorted)	200	(99) 49.5	(101) 50.5	N/A
8	Try-square	300	(64) 21.3	(236) 79.7	N/A
9	Micrometer screw gauge	100	(35) 35	(65) 65	N/A
10	Vernier calipers	100	(43) 43	(57) 57	N/A
11	Spring divider	300	(70) 23.3	(230) 76.7	N/A
12	Hammers (assorted)	300	(68) 22.7	(232) 77.3	N/A
13	Anvil	20	(13) 65	(7) 35	A
14	Scribers	300	(89) 29.7	(211) 70.3	N/A
15	Tap and wrench, stuck and dies(set)	50	(24) 48	(26) 52	N/A
16	Calipers (inside, outside, odd-leg)	50	(33) 56	(17) 44	A
17	Snip/hand shears/table shears	100	(28) 28	(72) 72	N/A
18	Drill bits (set)	200	(47) 23.5	(153) 76.5	N/A
19	Hacksaw frames	100	(102) 102	NIL	A
20	Hacksaw blade (consumable)	200	(138) 69	(62) 31	A
21	Engineer's hand vice	100	(19) 19	(81) 81	N/A
22	Clamps (assorted)	100	(35) 35	(65) 65	N/A
23	Riveting pliers	50	(36) 72	(14) 28	A
24	Hand stake (assorted)	50	(22) 44	(28) 56	N/A
25	Tinman's hand-lever punch	100	(20) 20	(80) 80	N/A
26	Grooving punch	30	(7) 23.3	(23) 76.7	N/A
27	Soldering iron/bit	100	(41) 41	(59) 59	N/A



28	Electric hand grinding tools	50	(17) 34	(33) 66	N/A
29	Hand-lever corrugated bench shear	50	(4) 8	(46) 92	N/A
30	Set of screw drivers (assorted)	100	(59) 59	(41) 41	A
31	Vee-block (assorted)	50	(25) 50	(25) 50	N/A

**Key:** Negative = 1.00 – **NB:** Figures in parentheses indicate number of hand tools available and not available

**KEY:** “A” Available. “N/A” Not Available

The results of the study on the percentage available and non-available hand tools in the technical colleges are shown in Table 2. All the 31 hand tools that were expected to be found in the technical colleges were available which ranged between 8-72%. Out of 31 hand tools item 19 was found to be more than what was required with 2% increment over the required number. Items 31, 30, 13, 16, 20, and 23 showed respective percentage availability of 50, 59, 65, 56, 69, and 72. All other items had percentage availability that was below 50. In all the hand tools, item 29 was least in availability with 8%. A close look at the results of the available of hand tools in the technical colleges under investigation revealed that the minimum standard that was set is not met (Table 2).

### Findings of the study

- I. Available equipment in metalwork trade are quite few for consideration of design thinking implementation in the technical colleges under study.
- II. Most hand tools are not available to average level and this could hinder design thinking implementation in metalwork trade in the technical colleges under study.

### Discussion

The findings of this study with respect to the level of availability of instructional materials in technical colleges indicated that most of the equipment and hand tools were not available at all in some colleges in Kwara and Niger states. The essentiality of availability of instructional materials supposes not to be compromised especially in the technical colleges where learning by doing is desired cum the principles of design thinking that involves physical practice. Provision of tools and equipment is one of the major factors that need to be considered in the accreditation of any technical subject in technical colleges. Equipment such as drilling machine, grinding machine, oxy-acetylene welding equipment, spot welding machine, milling machine, lathe machine, and shaping machine are seriously lacking in most colleges.

However, for student to achieve the right skill, tools and equipment must be available and adequate for effectiveness of the design thinking approach as instructional process.

### Conclusion

This paper has assessed the availability of metalwork instructional materials needed for design thinking implementation as innovative approach in technical colleges. The availability of these equipment will in-turn improve the technological and problem-solving skills of the students. It contributes to the advancement of the nation in the area of

technology and reducing the high rate of unemployment in the society. It is hoped that following the recommendation will go a long way in equipping the technical colleges with the required and necessary tools and equipment in metalwork trade.

### **Recommendations**

The following recommendations are suggested as a way of enhancing efficiency on human capacity and effective metalwork instruction;

- I. Technical colleges in Nigeria should be provided with the required tools and equipment in metalwork to aid easy implementation of design thinking approach for skill acquisition.
- II. The tools and equipment to be supplied for metalwork trade should be modern types that will be in conformity with 21st century and make the design thinking implementation achievable.
- III. Practical measure should be put in place to create synergy between industries and the government in the provision of metalwork tools and equipment for the colleges.

### **References**

- Albay, E. M. (2019). Analyzing the effects of the problem-solving approach to the performance and attitude of first year university students. *Social Sciences & Humanities Open*, 1(1). <https://doi.org/10.1016/j.ssaho.2019.100006>, 100006.
- Albay, E. M. & Eisma, D. V. (2021). Performance task assessment supported by the design thinking process: Results from a true experimental research. *Social science & humanities open*. 3 (1). <https://doi.org/10.1016/j.ssaho.2021.100116>,
- Ayonmike, S.C. (2011). *Skill training in Nigerian technical colleges: Benefits and challenges*, Abuja.
- Buchanan, R. (1992). Wicked problems in design thinking, *Design Issues*. 8, 5-21.
- Ryan, C. (2021). Assessment definition. Slideplayer.com Retrieved on 12/10/2021.
- Crites, K. & Rye, E (2020). Innovating language curriculum design through design thinking: A case study of a blended learning course at a Colombian University. *System*. 1- 12. <https://doi.org/10.1016/j.system.2020.102334>  
[www.elsevier.com/locate/system](http://www.elsevier.com/locate/system).
- De sena, P. S., Bento, M.C.M., Matias, N.T., Silva, M. B. (2021). Design thinking as active teaching methodology at the university-comparative studies between courses. *Racima21-Revista Científica Multidisciplinar*. 2 (4), 1-15
- Dolata, M., & Schwabe, G. (2016). Design thinking in IS research projects. In design thinking for innovation. Cham: Springer.
- Federal Government of Nigeria (2013). *National Policy on Education, 8th Edition*.Lagos: Nigerian Educational Research Development Council (NERDC) Press.

- Federal Ministry of Education (FME) (2000). The national master plan for Technical and Vocational Education Development in Nigeria in 21<sup>st</sup> century.
- Hager, F., & Uflacker, M. (2016). Time management practice in educational design thinking projects. DS 85-2. *Proceedings of NordDesign, ume 2*, 319–328. Trondheim, Norway, 10th-12th August 2016.
- James, E.O. (2009). Strategies for attracting and retaining qualified technical teachers in Ebonyi state technical colleges. *Ebonyi technology and Vocational Education Journal*, 1, 43-54.
- James, E. O. (2015). Influence of inadequate instructional materials and facilities in teaching and learning of electrical electronics technology education courses.
- Lembcke, T. (2016). *Towards an understanding of success dimensions in design thinking education*. Masters Thesis, Faculty of Behavioural, Management and Social Science (BMS) Technology Management and Supply (TM/S). University of Twente, Enschede, The Netherlands Technical University of Berlin, Germany. Retrieved on 24/08/2021 <https://www.researchgate.net>
- Luka, I. (2014). Design thinking in pedagogy. *Journal of Education, Culture and Society*. (2), 63–74.
- Mosely, G., Wright, N., & Wrigley, C. (2018). Facilitating design thinking: A comparison design expertise. *Thinking Skills and Creativity*, 27, 177–189. <https://doi.org/10.1016/j.tsc.2018.02.00>
- National business and technical examination board (NABTEB) (2014). *Syllabus for engineering trades for national technical certificate examination*. Benin City: Yuwa Printing Press.
- National Board for Technical Education (NBTE) (2001). *Foundry; National Technical Certificate (NTC) and Advanced National Technical Certificate (ANTC) Curriculum Module Specification*. Kaduna-Nigeria.
- Nwachukwu, C.E. (2006). *Designing appropriate methodology in vocational and technical education for Nigeria*. Nsukka, Enugu State: University Trust Publishers.
- Ogbu, R.O. (2007). Assessment of the utilization level of facilities for teaching and learning of metalwork in vocational technical colleges in Benue state of Nigeria. *Unpublished M.Ed. Thesis*, Vocational Teacher Education, University of Nigeria, Nsukka.
- Ogbuanya, T. C., Ogundola, P. T. & Ogunmilade, J. O. (2010). The level of availability of recommended tools and equipment for teaching motor vehicle mechanic works in technical colleges in south western states, Nigeria. *Nigerian Vocational Journal*, 14, 92-103
- Ogunleye, A.R. (2007). Evaluation of teaching resources for effective teaching and learning of metalwork in Ekiti state secondary schools. *Unpublished M.Ed. Thesis*, Vocational Teacher Education, University of Nigeria, Nsukka.

- Ogwa, C. E. (2002). *Effective teaching methods*, Enugu: Cheston Limited.
- Okoye, K. R. E. & Okwelle, P. C. (2013). Technical and vocational education and Training (TVET) in Nigeria and energy development, marketing and national transformation. *Journal of Education and Practice*, 4(14), 134-138. Retrieved online from <http://www.iiste.org>
- Okwelle, P. C. and Ikedi, O. (2020). Foundry pattern making skills required by metalwork technical college students in establishing small scale business in River state. *Vocational and Technical Education Journal (VOTE)*, 2 (1). ISSN:2651-6306
- Okwelle, P. C. & Tambari, M. D. (2017). Technical vocational education and training as a tool for sustainable empowerment of youths in Niger Delta, Nigeria. *International Journal of Innovative Social & Science Education Research* 5(1), 29-38.
- Owolabi, H.O.& Olasehinde, W. (2007). *An evaluation of effective and psycho- motor behavior in school-based assessment*. A paper presented at the 2007 Annual National Conference of the Nigeria Association of Educational Researchers and Evaluation.
- Razzouk, R., & Shute, V. (2012). *What is design thinking and why is it important?* <https://www.researchgate.net/publication/258183173>
- Retna, K. S. (2016). Thinking about “design thinking”: A study of teacher experiences. *Asia Pacific Journal of Education*, 36(1), 5–19. <https://doi.org/10.1080/02188791.2015.1005049>
- Rittel, H. W. J. (1972). On the planning crisis: Systems analysis of the first and second generations, *Bedriftsokonomien*. vol. 8, 390-396.
- Sarah, G. (2016). *Design thinking 101*. Nielsen Norman Group. <https://www.nngroup.com/articles/design-thinking/> Retrieved on 26/4/2021.
- Sharief, H., Nailah, C., Tania, S. D., & Tinashe, M. (2018). A modified stakeholder participation assessment framework for design thinking in health innovation. *Healthcare*. 6. 191-196. Retrieved date: 30/6/2021 <https://doi.org/10.1016/j.hjdsi.2018.06.003>
- Shehu, M. K. and Ibrahim, S. M. (2014). Assessment of resources for sustainable development in engineering and technology education in Bauchi state, Nigeria.
- Thoring, K. and Mueller, R. M. (2011). *Understanding design thinking: A process model based on method engineering*. International conference on engineering and product design education 8 & 9 September 2011, City University, London, UK. <https://www.researchgate.net/publication/234065413>
- Tuimur, H. N. and Chemwei, B. (2015). Availability and use of instructional materials in the teaching of conflict and conflict resolution in primary schools in Nandi North District, Kenya. *International Journal of Education and Practice*. 3(6). 224-234 ISSN(e):2310-3868

- Umunadi, K. E. (2009). Teacher utilization of instructional equipment and materials in teaching basic electricity in urban and rural technical colleges. *International Journal of scientific research in education*, 2 (2), 88-95.
- Varkey, P., Horne, A., and Bennet K. E. (2008) Innovation in health care: a primer. *Am J Med Qual.* 23(5):382–388.
- Vocabulary.com (2021). Availability. <https://www.vocabulary.com>
- Wrigley, C., Mosely, G., & Tomitsch, M. (2018). Design thinking education: A comparison of massive open online courses. *She Ji Journal oFDesign Economics and Innovation.* 4(1) 275-292. DOI:10.1016/j.sheji-2018.06.002.

## THE EFFECT OF SOCIAL MEDIA USAGE AND ANXIETY ON ACADEMIC ACHIEVEMENT AMONG SENIOR SECONDARY SCHOOL STUDENTS IN SOKOTO STATE

<sup>1\*</sup>Ramatu Muhammad Maiwada & <sup>2</sup>Fatima Abubakar Lawal

Department of Educational Foundations,  
Faculty of education,  
Sokoto State University, Sokoto.  
Email: [ramatumaiwada@gmail.com](mailto:ramatumaiwada@gmail.com)<sup>1</sup>

<sup>2</sup>Sultan Bello Secondary School Sokoto  
Email: [fatimalawal1001@gmail.com](mailto:fatimalawal1001@gmail.com)<sup>2</sup>

---

### Abstract

*The aim of this study was to examine the relationship between social-media usage and anxiety on academic achievement among senior secondary school students in Sokoto state, Nigeria. A quantitative survey research design was employed to examine 400 students from senior secondary schools in Sokoto state. For the collection of data, questionnaires, namely: Social-Media Usage Test Scale (SMUTSQ), Anxiety Test Scale (ATS), and Students Academic Achievement Scale (SAAS) measured by their result in their senior secondary school examinations were used. The result of analysis indicated a negative and significant relationship between social media usage and anxiety ( $r = -0.80$ ;  $p < 0.05$ ) and a negative and significant relationship between social media usage and academic achievement ( $r = -0.34$ ;  $p < 0.05$ ). Based on the findings and discussions, it can be concluded that anxiety and social media usage have significant negative effect on academic achievement. It can also be concluded from the findings that social media usage negatively and significantly moderated the effects of anxiety on academic achievement. The findings of this study have a great contribution to the theoretical body of knowledge on students' social media usage and test anxiety, particularly in Sokoto state, Nigeria.*

**Keywords:** Social-Media, Anxiety, Education, Academic Achievement, secondary school students

### Introduction

Academic achievement denotes performance outcomes that indicate the extent which an individual has attained specific goals of the planned educational period Steinmayr et al. (2017). Academic achievement depicts the educational system's success in aiming and attending to individual needs (Aloka et al, 2018). It is one of the most important goals of any meaningful educational process. Sokoto state of Nigeria has been ranked low in all external examinations; National Examination Council (NECO), West African Examination council (WAEC) and National Board for Technical and Business Education (NABTEB). This is evident in the Reports that, only about 20% of the state students passed their Senior Secondary School Certificate Examinations (SSCE) organised by NECO, WAEC and NABTEB respectively (National Bureau of Statistics, 2017).



Students today face lots of problems which include test anxiety; this usually affects and impairs learning, leading to poor performance in exams. Test anxiety is common among learners; thus, it is a phenomenon that most students have to battle with. (Stoker and Perkin 2014) have posited that test anxiety usually affects and impairs learning and affects exam performance; this problem, therefore needs be tackled effectively in order to improve academic achievement. In recent times, there is an upsurge in the usage of social media among individuals, the concern here is the addictive nature the internet has on the general public; particularly on students in institutions of learning.

Researchers like (Niemez, Griffiths and Banyard, 2005; Kakaraki, Tselios and Katsonas, 2017; Iyitoglu and Celikoz, 2017), posit that the increasing usage of social media is linked to the free and unlimited access to information provided by the internet on a 24 hourly basis. Social media also provides avenue for students to escape from stressful activities, while at the same time enable them seek for companionship, (Jacobsen, 2011; Masud et al, 2016; Ngoumandjoka, 2014). This study, therefore seeks to contribute to the body of empirical knowledge on the social media usage, anxiety and academic achievement, particularly among senior secondary school students in Sokoto state, Nigeria. No study in Nigeria has investigated these three combined variables together to investigate students' achievement.

### **Statement of the Problem**

According to Dinga, Mwaura and Ng'ang'a (2018), schools are established with the soul objective of imparting information and skills to those who go through them, hence behind this is the aim of improving good academic performance. Therefore, understanding the position elements of academic achievement of students is crucial to successful and effective intervention in order to bring quality education. However, over the past decade the performance of secondary school students in Sokoto has consistently been poor and unimpressive, it becomes a major point of concern as the achievement level of the students in senior secondary schools are considered low not impressive. Secondary school students face many challenges which interfere with their academic achievement; some of these intruding elements are anxiety and social-media usage among others.

The incessant failure by students in Senior Schools Certificate Examination (SSCE) in Secondary Schools in Sokoto State has been a matter of worry to parents, teachers, school administrators, government and all other stakeholders in the Education Sector in Sokoto state and in Nigeria as a whole. Although this condition could be attributed to various causes, it appears academic anxiety is at the root cause of these problems which compromise academic achievement, as deduced by Bala & Shaafiu (2016). One can therefore deduce that students who experience academic anxiety are likely to underachieve academically. The use of social media among students not only enables the activities of teaching and learning to be easily accessible, but has progressed beyond the borders of numerous technological advancements' user boundaries. Hence, Nayar (2018), postulated that social media is deemed to be an awesome means of supportive reciprocal learning as it promotes learning while it motivates learners; it makes learning convenient, as well as promoting easy leaning collaboration with virtual connectedness.

Social media tools offer informal learning convenience which enhances teaching and learning. The central focus of this study thus, is to investigate how anxiety and social media usage have affected students' achievement in Sokoto state, a northern part of



Nigeria. The current study has exercised a quantitative approach where data was collected through a questionnaire consisting of items adapted from well-reviewed researches.

### **Social Media**

Social media is a broad categorical term for technologies that facilitate user sharing, content creation, and information exchange within online communities or networks. Specifically, social media platforms can be defined as technologies, “that allow the creation and exchange of user generated content,” (Kaplan & Haenlein, 2010, p. 61). This definition includes tools that allow users to easily create new content, including blogs (e.g., WordPress), micro-blogs (e.g., Twitter, Tumblr), video sharing (e.g., YouTube), and video conferencing (e.g., Google Hangouts, Skype, Facebook).

The Nigeria Education Sector, particularly the primary and secondary schools’ sector has not deployed the usage of the internet for teaching and learning in Nigerian schools; therefore, the only role of the social media known to the students is to utilize the media for chatting and making friends online. This has culminated into the misuse of the social media, thereby resulting to the poor academic achievement of the students due to excessive usage.

As a result of engagement with such services, social media users typically create highly interactional platforms through which individual students or student organizations can share ideas, co-create, modify, and discuss user generated content or previous content posted online. (Nayar (2018), considers social-media as an awe-inspiring supporting platform for common learning which provides educational inspiration and engagement with ease to learners, it strengthens the goal of learning with virtual connectedness, at the same time it provides easy access to the informal learning environment.

However, the high usage of social media has turned the present generation to be completely immersed in it. Social media usage does not only create stress in its users, but also causes unhappiness with life and a decrease in academic achievement. Thorisdottir et al. (2019), explored social media usage and signs of anxiety among adolescents and proposed that passive usage of social media was associated with greater anxiety symptoms for students and adults. Both active and passive extreme usage of social media by students is expected to develop into problematic usage. Previous studies have confirmed a close relationship between problematic social media usage and anxiety (Hussain and Griffiths, 2018; Wong et al., 2020). Against this background, this study investigated the effect of Anxiety, and Social-Media Usage on Academic Achievement of senior secondary students in Sokoto state.

### **Anxiety**

According to Nail, et al (2015), anxiety symptoms are extremely common in childhood and adolescence and can negatively interfere with general well-being, social life, academic performance and even the development of social skills; anxiety is related to learners’ academic underachievement and low performance. They further stressed that anxiety could affect tasks such as getting assignments done, paying attention to given tasks, it could even disrupt an overall academic performance. Brady, Hard and Gross, (2018), in Texas, USA found out that a certain amount of anxiety could be beneficial to learning or productiveness. However, in Suresh’s (2016) study, he discovered that anxiety is more associated with lower performance than emotional reactions or responses.

When students experience anxiety, their mental capacity is used to produce and process worrying feelings, thus making it very difficult to focus on learning. Such disparity as enlightened by Gichohi (2019) can be exhausting for learners, which detracts from their learning abilities. In a more common sense, anxiety is characterized by symptoms, including emotional fright, moist palms, bad temper, high shivers, and uneasiness among others. It may be unpleasant, but it is often adaptive and, in its absence, one may have trouble as life becomes difficult to organize.

### **Academic Achievement**

In Nigerian context, academic achievement is the students' performance in School, measured by grade reports, teachers' observation and self-perception. It is the outcome of the education and determine the level to which a student or institution has achieved their educational goals. In secondary level, a high academic achievement is necessary for the students as it is a clear demonstration of their understanding of concepts, skills ideas and knowledge acquired during the learning period.

Academic achievement indicates the knowledge and skills that a student acquired in school subjects (Fafunwa, 1974). Similarly, in Steinmayr et al (2017), Academic Achievement depicts performance results that indicate the level to which an individual has attained particular goals that were specified for instructional purposes, particularly in school. Similarly, Tuckman (2018), perceives academic achievement as a clear show of comprehension of skills, ideas, concepts and learning procedures.

### ***Relationship between social media and Academic Achievement***

Using social media to enhance the learning process can take a number of forms, target various skills, and utilize different tools. Social media tools have the potential to enhance learning activities by providing opportunities for students to participate in class work, especially introverted students who lack the confidence needed to engage in face-to-face activities. The use of social media on education can enhance learning, the use of social media tools can improve students' learning opportunities, and the tools can allow for real-time communication even outside the classroom, foster collaborative learning opportunities and also enhance creativities in education.

Students could access and watch educationally relevant videos or exchange information about what they have watched and learned, join online group discussions while this is going on. Several studies have been carried out by different researchers to assess how the use of social media impact students' academic achievement.

This study proposed and investigated the effect of anxiety and social-media usage on academic achievement among senior secondary school students in Sokoto state. The use of social media improves learning; according to Mushtaq and Benragdh, (2018), who found out in their study of social media usage that social media is perceived to be a convenient means for students in their lessons as they use them to enhance their learning processes, it aids effective communication and helps to receive school information with ease. However, researchers like: (Turel and Toraman, 2015. Masud et al., 2016, Iyitoglu and Celicoz, 2017), posited that excessive usage of the social media degrades educational achievement.

## **Students' Social Media Usage**

The level at which students use social media has been recently investigated by a number of counsellors and student affairs specialists. It was found out that there is a negative relationship between social media usage and academic achievement. Yeap, et al. (2016), suggested that when students are immersed in internet usage, their academic activities decrease, their study habits are weakened and they are bound to be absent in classroom activities and may miss examinations.

Some studies have identified that excessive usage of the internet and social-media may lead to negative results in academic achievement and other social skills (Koshal and Gupter, 2016). This significant usage of social media may be associated with the increase in mobile devices, allowing current college students to access social media through phones, tablets, and other devices in addition to traditional computer usages, as such Newman (2016), postulated that when people prolong the time they spend on social-media, they have to reciprocate such time in other areas like areas of study and assignments. Social-media and new social media platforms (e.g., Snapchat and Instagram) are challenging Facebook in popularity and use among college students. Therefore, it is very likely that the frequency and length of time spent accessing social media is much greater.

## **Theoretical Framework**

### ***Test Anxiety Theory***

Among the theories that explained test anxiety is: theories like the interference theory, model deficits theory and information processing theories. These theories have given insight into the impact that test anxiety has on students' educational achievement, (Hambree 1988; as cited in Bodas and Ollendick, 2005:69). The area that has much attention in the current study in investigating test anxiety is: worry and emotionality factors. Though, worry includes the cognitive feature of test anxiety, emotionality on the other hand impacts on psychological changes which occur while tests are being conducted, (Cohen, et al 2008).

Test anxiety is common among learners; it is a phenomenon that most students have to battle with. (Stoker and Perkin 2014), have earlier posited that test anxiety usually affects and impairs learning and affect exam performance; this problem therefore needs be tackled effectively in order to improve academic achievement in Nigerian secondary schools.

### ***Social Media theory***

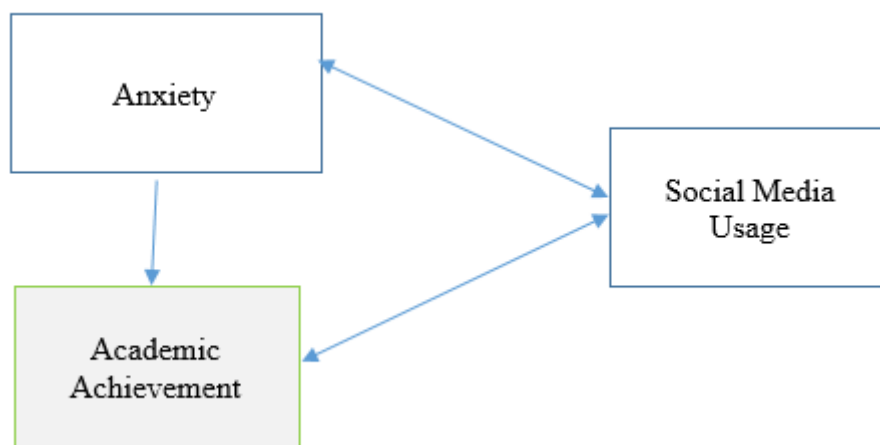
Cognitive explanatory theory, as expounded by Jane Piaget in 1936 has given insight into behavioural activities. The theory posits that social media over usage is traceable to defective perception and an individual's intention to overlook internal and external difficulties by engaging in massive social networking platforms. It has been theorized that the use of social media, as predicted and believed by instructors, affect a wide range of behaviours of the student's academic achievement. These aspects include attention span, writing, face-to-face communication, homework, and critical thinking. Social media has become a significant pastime activity for many, allowing individuals to connect with one another online irrespective of time and space limitations (Kuss & Griffiths, 2017).

## Conceptual Framework

This study investigated the relationship between: anxiety, social media usage, and academic achievement among secondary school students in Sokoto State, Nigeria. It focused on examining how anxiety and social media have impacted on the academic achievement of secondary school students in Sokoto, Nigeria.

Investigating the effect of social media usage on academic achievement of students is very important because this will provide an avenue for counsellors and stakeholders to implement methods that will help in enhancing academic achievement in schools; particularly Sokoto state. Investigating the moderating role of social media usage on the relationship between anxiety and academic achievement will go a long way in finding a solution to this misuse; as a result it will provide a means of curbing this abuse and enhance quality in educational achievement in Sokoto state.

The current study has developed the following research framework to aid the investigation of the relationship between: anxiety, social media usage, and educational achievement. The research framework as presented below depicts the direct impact of social media usage on anxiety and academic achievement of students in Sokoto state, Nigeria. The interactive effect of social media usage and test anxiety in this study suggested that both anxiety and social media usage decrease by 1.2% for each unit of social media usage, suggesting that a unit increase in social media usage will decrease academic achievement by 1.2%. This implied that there is a strong moderating effect of between social media usage and test anxiety among secondary school students in Sokoto state, Nigeria.



**Figure 1:** Conceptual Framework

## Objectives

This study aimed at examining the relationship between social-media usage and anxiety on academic achievement among senior secondary school students in Sokoto state, Nigeria. The following research questions were set to address the research objectives:

## **Research Questions**

RQ 1: Do social media usage relate to anxiety and academic achievement of senior secondary school students in Sokoto state?

RQ 2: What is the effect of social media usage on academic achievement among senior secondary school students in Sokoto state?

RQ 3: What is moderating effect of social media usage on the relationship between anxiety and academic achievement?

## **Methodology**

### **Research Design**

Research design is the general arrangement of study including four primary thoughts; the procedure, the framework, the inquiries of who and what to be considered and the tools utilized for gathering and analysis of data (Punch, 2014). In reference to the above, this study employed a quantitative approach as the study aimed at investigating the relationship between three variables (Anxiety, Social Media Usage and Academic Achievement). Quantitative research does three main things; it conceptualizes reality in terms of variables, it measures those variables and it studies relationship between those variables. In a quantitative research, measurement is a prominent step in the research process that occurs prior to data collection.

This study also planned and carried out a data collection and analysis using non-experimental correlational survey design. In this type of design, data are collected and analysed by the investigator in order to make inferences about a specific population and time. In correlational design groups of variables are compared at the same period of time. Thus, it constituted the basis for the variables under this study because it sought to seek evidence on the influence of one variable on the other (Coolican, 2009; Kaplan, 2008).

Therefore, this study considered survey and correlational design to investigate the relationship between Anxiety, Social – Media Usage and Academic Achievement among secondary school students in Sokoto State Nigeria, using a quantitative approach for data collection and analysis.

### **Sampling:**

Sample in research study implies an area, part or part of the research population that is depictive of the whole populace, while sampling means the process of picking a depictive portion of the population for specific research. To decrease systematic predisposition, a sampling strategy needs to be created to boost representativeness (Burns and Grove, 2004).

There exist different techniques for example dimension resolution; which include utilizing a nose count for little dimension populaces, mimicking an example dimension of associated researches, using published tables and also applying formulas to compute sample size (Panah, 2014). However, a Stratified Random Sampling Procedure was adopted in this study to select the sample based on the contribution of each stratum to the research study's populace (Proportional). This was to guarantee fair representation of all the strata since all the teams were taking part in the exact same discovering problem as well and assessed on the very same conventional irrespective of their background.

## Demographic Data

The demographic data for this study comprised of 400 respondents from public and private senior secondary schools in Sokoto state, Nigeria.

## Data Collection

The collection of data for this study involved 400 respondents who were final year candidates in public and private secondary schools in Sokoto state. Under the supervision and assistance of the teachers, the candidates were assigned the questionnaire to complete. All the sections of the questionnaire were appropriately completed. i.e. Anxiety Test Scale, Social Media Test Scale, Questionnaire and Academic Achievement Scale (ATSSMUTSQ).

## Anxiety Test Scale (ATS)

Test anxiety Scale (Spielberger et al., 1983) is one of the most generally utilized instruments for estimating test anxiousness in high school and also undergraduates. The ATS includes 20 objects examined on a 4-point Likert range (1= almost never ever, 2= sometimes, 3= often, 4= often), where respondents demonstrated how regularly they had actually come across the feedback to tests portrayed in objects, yielding an all-out examination stress and anxiety score running from at least 20 to a limitation of 80 points. The ATS yields 3 subscale ratings that gauge ATS-Total, ATS-Worry as well as ATS-Emotionality (sub-dimensions).

A psychometric detail on the ATS suggests sufficient test-retest reliability as well as internal consistency reliability. Test-retest dependability for the ATS total ratings, and the Fear, as well as Emotionality sub-scales, has actually extended from.72 to.88. The inner uniformity reliability as approximated by Cronbach's alpha for the ATS accumulation, fret sub-scale, as well as Emotionality sub-scale are.90,.84, as well as.80, individually. The ATS furthermore has actually shown enough validity to link the ATS and its sub-scales with other anxiousness measures, for example, Sarason's Examination Anxiety Scale (EAS; Sarason, 1978), gave proof of present validity as shown in Table 1 below:

**Table 1: Anxiety Test Scale (Sub-Scales)**

SN	Sub-constructs	Items	Initial Reliability
1	ATS-Worry	3, 4, 5, 6, 7, 14, 17, 20	0.80
2	ATS-Emotionality	2, 8, 9, 10, 11, 15, 16, 18	0.84
3	ATS-Total	1, 12, 13, 19	0.90

## Social Media Usage Test Scale Questionnaire (SMUTSQ)

Social Media Usage Test Scale Questionnaire (SMUTSQ) (Şahin, 2018) is a 5-point Likert type scale which consists 29 items and composed with the 4 sub-dimensions, i.e., Virtual Tolerance (VT), Virtual Communication (VC) Virtual Problem (VP) and Virtual Information (VI). All of the objects in the scale are positive. The lowest point to be scored is 29 and the highest point is 145. The higher scores indicate that respondent perceives himself as a “social media addict”. The internal consistency reliability of the instrument by sub-dimension in this study is depicted in the table below:



**Table 2:** Social Media Usage Test Scale Questionnaire (SMUTSQ) (Sub-Scales)

SN	Sub-construct	Items	Initial Reliability
1	Virtual Tolerance	1, 2, 3, 4, 5,	0.81
2	Virtual Communication	6, 7, 8, 9, 10, 11, 12, 13, 14	0.81
3	Virtual Problem	15, 16, 17, 18, 19, 20, 21, 22, 23	0.86
4	Virtual Information	24, 25, 26, 27, 28, 29	0.82

The Rasch Measurement approach was used in this study to estimate the reliability of the Anxiety Test Scale and Social Media Test Scale Questionnaire (ATSSMUTSQ). The reliability coefficient of the scales in both person and objects were deemed to be relevant, based on the fact of (ATSSMUTSQ) having excellent standards, person, item as well as adequate internal consistency reliability (Linacre, 2019 & Aziz et al., 2013), the proof of validity is shown above.

#### ***Students' Academic Achievement Scale (SAAS)***

The students' academic achievement in this study was measured by the students' result in their senior secondary school examinations. The level of the achievement was determined using the established standard scoring guide and grading system of Nigerian secondary school. The students' performance grading as provided by the West African Examinations Council (WAEC, 2018) are presented on table 3.

**Table 3:** Grading System in Nigeria for SSCE

Grades	Definition	Interpretation	Equivalent
A1	Excellent	75% - 100%	1
B2	Very good	70% - 74%	2
B3	Good	65% - 70%	3
C4	Credit	60%- 64%	4
C5	Credit	55% - 59%	5
C6	Credit	50% - 54%	6
D7	Pass	45% - 49%	7
E8	Pass	40% - 44%	8
F9	Fail	0% - 39%	9



### Data Analysis

To examine the internal consistency reliability of the research instruments in this study, the data collected from the administration were used to conduct test of reliability of the instruments using Rasch Measurement procedure. The results of the analysis provided a psychometrics information on the suitability or otherwise of the research instruments.

The data analysis proposed based on the research questions were thus summarised in Table 4 below

**Table 4: Data Analysis**

SN	Research Questions	Data	Analys s
RQ1	Does social media usage relate to anxiety and academic achievement of senior secondary school students in Sokoto state?	Quantitative	SEM Smart PLS
RQ2	What is the effect of social media usage on academic achievement of senior secondary school students in Sokoto state?	Quantitative	SEM Smart PLS
RQ3	What is the moderating effect of social media usage on the relationship between anxiety and academic achievement of senior secondary school students in Sokoto state?	Quantitative	SEM Smart PLS

### Research Results

The statistical description of the study’s constructs was examined using descriptive statistical analysis. Values or indices of the minimum score, maximum score, mean, and standard deviations were obtained and presented for all the dependent and independents constructs; all the constructs were measured in five points Likert scale. The result of the descriptive analysis is presented in Table 2.

**Table 5: Discriminant Validity for the Constructs**

Constructs	ANX	SMU	ACA
Anxiety	<b>0.855</b>		
Social Media Usage	-0.453	<b>0.872</b>	
Academic Achievement	-0.385	0.576	<b>0.936</b>

**Research Question 1:** Does social media usage relate to test anxiety and academic achievement of senior secondary school students in Sokoto state?

**Table 6: Correlation Matrix among variables**

Social Media	Anxiety: Worry Emotionality	Academic Achievement
--------------	-----------------------------------	-------------------------

Social Media	1.00		
Anxiety	-0.80**	1.00	
Academic Achievement (AA)	-0.34**	-0.37**	1.00
Social media usage (SM) (ATS) worry	0.80		
(ATS) Emotionality	0.84		
Social media	1.00		

Correlational matrix for SM and AA, Anxiety and AA variables are both above diagonal \*\*<0.01, this shows a positive correlation among the variables.

From Table 5, a correlation matrix was conducted to check for the relationship between social media usage and test anxiety, social media usage and academic achievement. The result of analysis indicated a negative and significant relationship between social media use and anxiety ( $r = -0.80$ ;  $p < 0.05$ ) and a negative and significant relationship between social media usage and academic achievement ( $r = -0.34$ ;  $p < 0.05$ ). In view of this result, it can be inferred that social media usage is associated with decreased level of anxiety and decreased level of academic achievement.

**Research Question 2:** what is the effect of social media usage on academic achievement among senior secondary school students in Sokoto state?

**Table 7:** Effect of Social media usage on Academic Achievement

	Std. Coefficient	T	p-value
SMU	-0.34	-7.202	0.000
Adjusted R2	0.113		
F-statistics	51.869		
p-value	0.00		

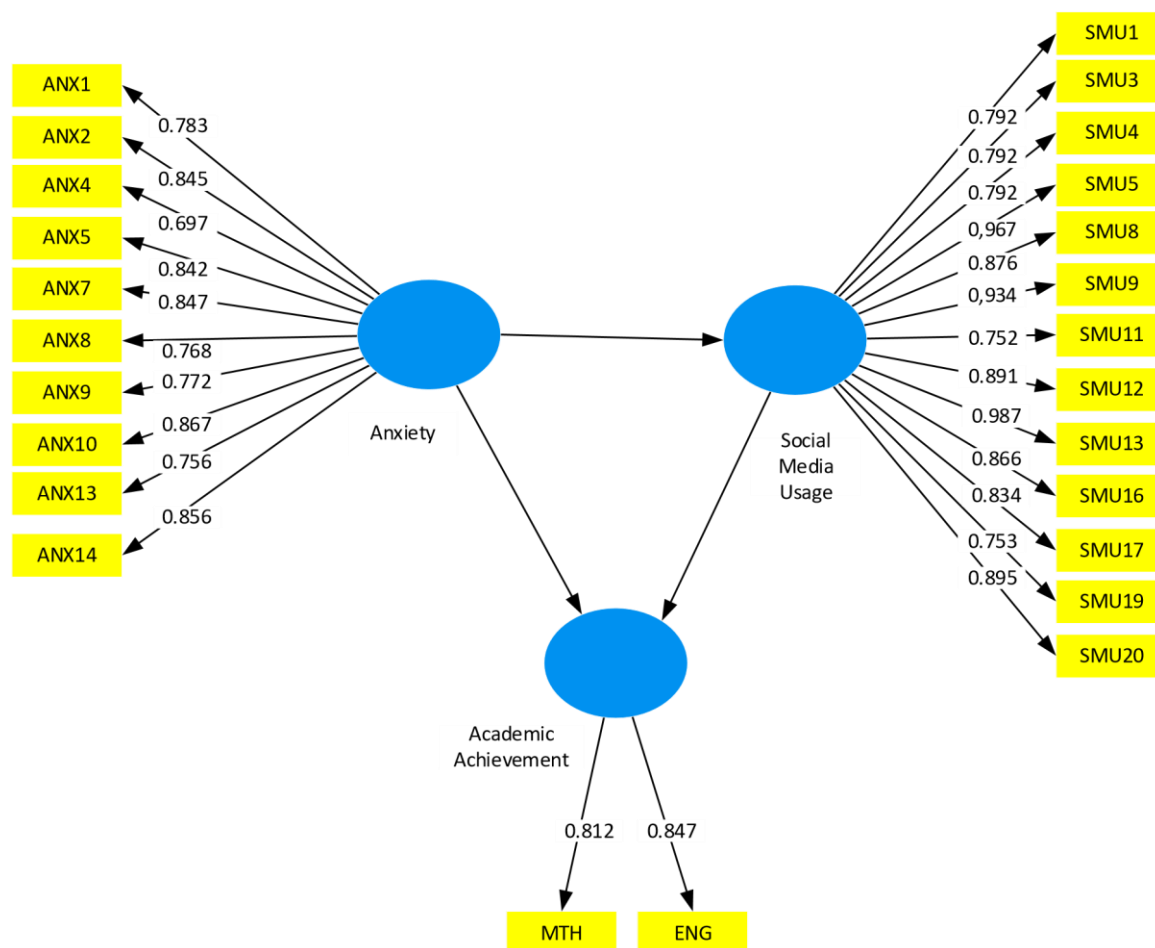
From the result presented in table 6, a linear regression analysis was conducted to examine the effect of social media usage on students' academic achievement. The dependent variable was academic achievement and the regression item was social media usage. The model indicated a good model fit ( $F = 51.86$ ;  $p = 0.00$ ). An inspection of the standardized estimates suggest that social media usage had a negative effect with academic achievement (standardized coefficient =  $-0.34$ ;  $t = -7.20$ ;  $p\text{-value} = 0.00$ ). The negative effect of social media usage indicated that a unit increase in students' social media usage will decrease their academic achievement by 0.3% and vice versa.

**Research Question 3:** What is moderating effect of social media usage on the relationship between anxiety and academic achievement?

**Table 8:** Moderating effect of SMU on relationship between Anxiety and Performance

	Std. Coefficient	T	p-value
ANX	0.95	3.742	0.000
SMU	0.782	3.094	0.002
SMU*ANX	-1.28	-2.774	0.006
Adjusted R2	0.153		
F-statistics	25.067		
p-value	0.00		

Based on result presented in Table 7, a multiple regression analysis was conducted to examine the moderating effect of social media on the relationship between anxiety and academic achievement. The regression model indicated a good model fit ( $F = 25.07$ ;  $p$ -value = 0.00). However, the coefficient of the interaction effect between social media usage and anxiety suggested that both anxiety and academic performance decrease by 1.2% for each unit of social media usage. This further suggested that a unit increase in social media usage will decrease students' anxiety and academic achievement by 1.2%. Thus, social media usage has a negative moderating effect on the relationship between anxiety and academic.



**Figure 2:** Measurement model for variables

The results of the analysis presented in Figure 2 revealed the obtained descriptive parameters of all the constructs. This result implied that the mean of each of the latent variables or construct of this study indicated that the average agreement of the respondents moderately agreed with the score of above-average point of 3.00. Similarly, the descriptive statistics mean all the values were close to mean. Thus, the respondents tended to moderately agree with all the statements indicating the existence or practicability of the concept in the relationship between Anxiety, Social Media Usage, and academic achievement.

## Discussion

One of the main aims of this study was to investigate the effect of Social-Media Usage and Anxiety, on Academic Achievement of senior secondary students in Sokoto state. The results have shown that social-media usage negatively and significantly moderated

the relationship between anxiety and academic achievement, while anxiety has significant negative effect on the students' academic achievement.

On a theoretical position, social media is predicted to improve individual's decision-making, reading skills and socializing skills as a result of the high interaction level it possesses (Ainin, Naqshbandi, Mushtaq, 2018). Nigeria is among the technologically developing countries in the world today, where network connectivity in the last decade has advanced tremendously. Thus, the increase in internet connectivity has allowed learners new avenues for self-innovations and educational activities, while substituting the customary classroom and library research base to e- research and learning (Lahiry et al, 2019).

Nonetheless, Patel et al. (2016) believe that social media usage is responsible for problems like; restlessness, sorrow, nutritional issues, and sleeplessness. The effect of social media usage on academic achievement, according to Gilbert et al. (2018) is both negative and positive.

**R Q 1:** Does social media usage relate to anxiety and academic achievement of senior secondary school students in Sokoto state?

This study found out that people use social media in order to compensate for deficits in social skills or discomfort in face-to-face situations, and that individuals use social networking sites to find additional opportunities to interact with others, it also found evidences that suggested that excessive usage of social media such as Facebook is associated with a significant level of stress and anxiety which negatively affects the student's academic performance. Social media has become an integral part of the lives of young adults, and the increase in multi-platform usages, (The Nielsen Company, 2017), agrees that it is a perfect way to provide many avenues for people to dialogue globally.

In the same vein, (Ainin, Naqshbandi, Mushtaq, 2018) believe that when used for educational purposes like (online lectures, discussion forums, faculty member's announcements, educational games and many others), social media will play a positive role; they are of the opinion that social-media can improve the academic success of students if they are used correctly in the classroom environment.

However, it was found out in this study that uncontrolled usage of social media is associated with high level of stress and anxiety; (Azizi et al., 2019) are in support of the findings. They therefore further confirmed this by expressing that stress and anxiety emanates from situations when individuals experience unpleasant news and interactions that cause emotional disturbance. In turn, this emotional disturbance is considered to have negative impact on students' attention in classroom activities and overall performance.

However, several authors have opposed this position, arguing that stress and anxiety caused by social media are short-lived and may not necessarily follow student to school. On the other hand, Kolan and Dzandza (2018) indicated that majority of students do not use social media for academics, but rather for making new friends at the expense of learning.

Stein and Sareen, (2015) believe that Anxiety is a widely nervous condition of the mind that is linked to prospective difficult situation or threats, this means that when an individual is faced with anxiety, he or she may likely experience symptoms like fatigue, weakness exhaustion, physical pain and depression.

**RQ 2:** “How does social media usage affect academic achievement among senior secondary school students in Sokoto state”?

The idea of using social media for teaching and learning cannot be over emphasised, it has heightened the activities of learning, and it enables real time connection outside the school, strengthens collaboration activities and improves creativity

This study discovered that the use of social media plays a big role in the lives of learners and the learning itself, because it makes it easier for learners to access information, provide information and communicate through the use of social media. Lecturers and learners are connected to each other through its usage as it enables them to perform their teaching and learning activities easily. Social media does not only facilitate the learning methods but also has made it possible for the communication gap between learner-learned become narrowed down as the instruction is carried beyond the classroom boundaries with the adequate use of virtual learning environments. Breen,(2018). Mushtaq and Benraragdha (2019) have predicted a great potential in the usage of social media to improve learning.

However, empirical evidence has shown that increased usage of social media, especially usage that deviate from learning, negatively affects study habits and productivity. Uncontrolled usage of social media reduces the study time, which has a negative effect on the academic performance of students. Also, as people who spend many hours around the clock using social media do not have enough rest, they suffer from exhaustion and sleep disruption; these can have a negative impact on their attentiveness and learning.

Social media is predicted to advance individual’s decision-making, reading skills and socializing skills because it has a high communication level. Similarly, Ainin, Naqshbandi & Mushtaq (2018), have opined that these skills are considered as the vital components that make up improved academic achievement. Thus, individuals who frequently use social media are more likely to perform better in classroom activities, particularly those that have to do with social expression, argument, writing skills, among others.

**RQ 3:** What is the moderating effect of social media usage on the relationship between anxiety and academic achievement?

Researchers the world over have found out that the fear of failing an exam has made some individuals to become so anxious, that fear, being experienced has become a motivating factor for them to work harder in order to achieve. Reviewing test anxiety and its impact on learning outcomes has a long history; for example, (Mandler & Sarason 1952, Spielberg 1962), believe that: Great anxiety from the fear of failure has been revealed to have a positive influence on academic achievement in high ability students, it provides them the determination to perform better; which may have been the motivation for these students. However, untreated anxiety in adolescents and young adults could result to several behavioural problems such as, physical, and mental difficulties (Mahmoud, Staten, Lennie, & Hall, 2015), uncontrolled usage of social media has a similar effect on individuals, as it could have a negative impact in spite of its usefulness, Gilbert et al. (2018).

Murphy and Gross (2017) have demonstrated that online network could make it very difficult for individuals to recognise useful messages from other various connections that have been created from web-based shared networks. If there is such reduction in the

number of significant connections, individuals might become intimidated and become afraid of the development of important interaction and communication. Anxiety and sleeping disorder are obviously related to usage of social media.

Put differently, when anxiety is experienced by students, their mental capacity is used to generate and process worrisome thoughts, thus making it extremely difficult to focus on learning. Such imbalance as explained by Gichohi (2019) can be exhausting for students, which detracts them from their learning abilities. In a broader sense, anxiety is characterized by symptoms, including emotional fright, moist palms, irritability, high palpitations, and tenseness among others. Students experiencing these symptoms are more likely to experience decline in concentration levels. Thus, anxiety can undeniably impact negatively on students' academic performance if not attended to (Von der Embse et al., 2018).

## **Findings**

Findings in this study imply that the negative effect of anxiety on academic performance is obvious, coupled with the introduction of negative effect of social media usage. The result showed that students have an uneasy upsetting feeling during final examinations, and thinking about the grade they get in a course interferes with work on tests. It also showed that during exams students find themselves wondering whether they will ever get through school as the harder they work at taking a test, the more confused they get. They also feel jittery when taking an important test, even when they are well prepared for a test, they still feel very anxious about it. Most students also agree that they start feeling very uneasy just before getting a test paper back and that during important exams they are so tense that they start developing stomach upset.

Mohammed, and Muhammad (2017), found in their study, that employed effects of test anxiety on university students' academic achievement in Northwest University, Kano, Nigeria. They recognized that students with intensified levels of anxiety recorded lower grades in comparison to their colleagues who attained higher grades with reasonable levels of anxiety. It is therefore obvious that academic anxiety has a relationship with academic achievement of university students.

Education is considered to be the light that illuminates the world; no nation will thrive if its educational system is poor. It is the ultimate goal of every individual to attain education, in the same vein, (Aloka et al, 2018) sees academic achievement as the educational system's success in directing and attending to individual requirements in education. Hence, understanding the position elements of academic performance of students is crucial to successful and effective intervention in order to bring about quality education. Because of the significant relationship between anxiety and educational achievement, it is very important to help secondary school students to manage their stress. In order to do so, this study recommends that students should maintain a healthy and stress less life style during the period of learning. Extra mural lessons, academic counselling, tutorials, extra instructions, and many others are some of the resources that stake-holders in education should explore in order to render assistance to secondary students with anxiety problems after assessing their needs.



## **Implications**

Implication: for Practitioners and Guidance Counsellors, the main aim of this study was to find out how anxiety and social-media usage effect the academic achievement of senior secondary school students in Sokoto state, Nigeria. The results have shown that social media usage has negatively and significantly affected the relationship between anxiety and academic achievement, while social-media usage significantly moderated the effect of academic achievement. Anxiety has significant negative effect on the students' academic achievement; therefore, the findings of this study have important practical implications for professionals and practitioners in the field of guidance and counselling, particularly, to the educational institutions in Nigeria.

Thus: The study established justifiable evidence that anxiety has a significant negative effect on students' academic achievement. Thus, all practitioners in guidance counselling can utilize anxiety control strategies in their counselling to help students increase their academic performance.

The level at which students use social media has been recently investigated by a number of counsellors and student affairs specialists; therefore investigating the usage of Social-Media alongside Anxiety in relation to students' academic achievement is crucial and is believed that it will go a long way in addressing students' poor academic performance in secondary schools. The study contributes to the existing body of knowledge in regards to the multifaceted effect of anxiety, social-media usage in secondary school students' academic achievement.

Considering how significantly anxiety negatively effects students' academic achievement, further study on types of anxiety and control techniques need to be carried out. This will give better understanding and a deep knowledge of types of anxiety and various control techniques; therefore there is need for more studies on effective usage of social media for enhancement of academic achievement of students at various levels of education in Sokoto stat, Nigeria.

## **Limitations**

The limitations of this study are various; first the study used the students' achievement test to examine academic achievement, other means of obtaining academic achievement results should be explored, like interview, computer-based testing and others. Secondly only senior secondary school students were sampled; therefore, it is suggested that junior secondary school students and other level of students should also be examined in order to achieve a wider result; also, in future research should be conducted in other states in Nigeria using same variables. There are also other variables that could affect academic achievement other than anxiety and social media usage, for example, student's socio-economic status, personality traits, learner's wellbeing and other factors; as such, current findings may change if other variables and study groups are examined. Therefore, future research should focus on such other variables.

## **Conclusion**

The study aimed at investigating the relationship between: anxiety, social media usage, and academic performance among secondary school students in Sokoto State, Nigeria. The study focused on (a) Examining the relationship between: anxiety, social media usage, and academic achievement among senior secondary school students in Sokoto

state; (b) Investigating the effect of social media usage on the relationship between anxiety and academic achievement among senior secondary school students in Sokoto state; and (c) Investigating the moderating role of social media usage on the relationship between anxiety and academic achievement of senior secondary school students in Sokoto state.

“Test anxiety and its impact on academic achievement and education generally varies depending on the person, some students agreed that they start feeling very uneasy just before getting a test paper back and that during important exams they are tensed up that they start developing stomach upset. Hence, Ibukun Adeoye-Agboola (2015) who studied “The Relationship Between Anxiety and Academic Performance of Postgraduate International Students in a British University, using: A Cross-Sectional Quantitative Design” revealed that, anxiety can affect international students on their academic performance through their finances, career aspiration and workload. Another study on “The relationship between study anxiety and academic performance among English students” conducted by Weda & Sakti (2018) revealed that, anxiety is negatively related to academic performance with the participants’ anxiety scores. Hence, findings imply that there is a significant relationship between high level anxiety and low academic performance among English students at State University of Makassar, Indonesia.

As earlier speculated, the effect of social media usage on academic achievement, according to Gilbert et al. (2018), could be both negative and positive. This was further confirmed by the findings of Azizi et al. (2019), who studied “The relationship between social networking addiction and academic performance in Iranian students of medical sciences: confirmed and found that a negative and significant correlation exists between social networking addiction and students’ academic performance, this implies that, an increase in the excessive usage of social networks weakens academic performance. This is in line with the findings of Kolan (2018), who studied the “Effect of Social Media on Academic Performance of Students in Ghanaian Universities : A Case Study of University of Ghana , Legon” he discovered that, in spite of the benefits that students derive from social media networks, such as exchanging information, making friends, participating in group discussions from near and far among others, there is bound to be distraction of attention caused by the use of social media which could have serious consequences on the academic life of students.

Based on the findings and discussions of this study, it could be concluded that anxiety and social media usage negatively and significantly affect students’ academic performance; the study also showed that social media usage negatively moderated the relationship between anxiety and academic achievement among secondary school students in Sokoto state.

**Conflict of Interest:** The author declares that there is no conflict of interest.

**Funding:** Self

## References

- Ainin, S., Naqshbandi, M. M., Moghavvemi, S., & Jaafar, N. I. (2015). Facebook usage, Socialization and Academic Performance. *Comput. Educ.* 2015, 83, 64-73.

- Aloka, J. O., Juma, D. A., and Nyaswa (2018). Gender differences in academic achievement among returnee students in Kenyan secondary schools. *International Journal of advanced and Multidisciplinary Social Sciences*, 4(1): 8-12.
- Azizi SM and Soroush A. Khatony (2019). The relationship social networking addiction and Academic performance in Iranian students of medical sciences A cross-sectional study. *BMC Psychol*, 7(1), 7-28.
- Bala, P. & Shaafiu, K. (2016). Academic performance of secondary school students in Relation To their problem-solving ability and examination anxiety. *International Journal of Indian Psychology* 3(4), 66.
- Brady, S. T., Hard, B. M., and Gross, J.J. (2018). Reappraising test anxiety increase academic Performance of first-year college students, *Journal of Education Psychology* 110(3), 394-406.
- Bryer, T. and Zavatorro, S. (2016). Social-media and public administration: Theoretical dimension and introduction to symposium. *Administrative Theory and Praxis* 33(3).327-342.
- Cohen, S., Mermelstein, R., Kamark, T., and Hoberman, H. M, (1985). Measuring the functional components of social support. In I. G. Sarason and B. R. Sarason (Eds.), *Social support: Theory, research, and application* (pp. 73-94). Dordrecht: Martinus Nijhoff Publishers.
- Coolican, H. (2009). *Research methods and statistics in psychology*. London: Hodder.
- Dinga, J. N., Mwaura A. M., and Ng'ang'a M, W. (2018). Relationship between achievement Education, *Psychology*, 7 (1), 34-39.
- Fafunwa, A. B. (1974). *History of Education in Nigeria*. U. K; George Allen & Urwin Limited.
- Gichohi, N.W. (2019). Influence of anxiety on Academic Performance among students at the Technical Goal orientation and academic achievement among form three students in Kiambu County, grades. A quantitative analysis, *Applied Economics*. 28, 919-928. Goal orientation and academic achievement among form three students in Kiambu County, grades. A quantitative analysis, *Applied Economics*. 28, 919-928.
- Hussain. Z., and Griffiths, M, D., (2018). Problematic social networking site use and comorbid psychiatric disorders: a systematic review of recent large-scale studies, *Front, Psychiatry*, 9:686.
- Jacobsen, W. W., and Forste, R. (2017). The wired Generation: Academic and Social Outcomes of Electronic media Use Among University Students. *Cyberpsychology, Behaviour, and Social Networking*, 14(5),275-280
- Khalid H. (2017) The Effects of Networks on Pakistani students. *J. Inf Technol Softw Eng*. 7(3), 1-6.

- Kolan, B. J., and Dzandza P.E. (2018). Effect of social media usage on performanceachievement of students in Ghanaian Universities: A case study of University of Ghana. Legon. Library Philosophy and Practice (*e-Journal*) 1637. Retrieved on 7/3/19 from [http://digitalcommons. Unl.edu/lib/philprac/1637](http://digitalcommons.Unl.edu/lib/philprac/1637).
- Koshal, M.A., and Gupter, A. K. (2016). Academic achievement and television viewing by Eight Graders: A quantitative analysis. *Applied Economics*, 28,919-928.
- Lahiry, S., Choundhury, S., Chatterjee, S., and Hazra, A., (2019). Impact of social media on academic Performance A cross-sectional study among students at a tertiary medical centre in East India. *J Educ. Health Promot*, 2019;8:73.
- Lenhart, M. and Madden M. (2015). “Teen’s privacy and online social networks, how teens manage Their online identities and personal information in the age of my space,” Pew Internet and American Life Project Report, pp1-45,2007.
- Masud, M. M., Ahmad, S., Rahman, M., and Akhtar, R. (2016). Measuring Psychological Effect and Interne Addiction Towards Academic Performance of Tertiary Students in Malaysia. *International Journal of Research in Business and Tecnology*,9(1)991-1002.
- Talaue, M. G., et al. (2018). “The impact of social media academic performance of selected college Students.” *International Journal of Advanced Information Technology*, 4-5 pp:27-35.
- Mahato, B. & Jangir, S. (2012). A study on academic anxiety among adolescents of Minicoy Island. *Information systems*, 33(4), 1087-1116.
- Mahmoud, J.R., Staten, R., Lennie, T. A., and Hall, L., A. (2015). The relationships of Coping, Negative thinking life satisfaction, social support, and selected demographics with and Anxiety of young adult college students. *Journal of Child and Adolescent Psychiatric Nursing*, 28(2), 97-108
- Moges, E. (2017). Determinant of academic performance of undergraduate students: in the Case of Arba Minch University, Chamo Campus. *Journal of Education and Practice*,8(10):1ts55-156.
- Mohammed, S. M., Hailu. S. & Muhammad, M. A. (2017). Effects of examination anxiety on university. Students’ academic performance in Northwest University, Kano, Nigeria; *European Journal of Education Studies*. 3(5), 776-807.
- Mushtaq, A. J., (2018), The Effects of social media on the Undergraduate Students’ Academic Performances. Library Philosophy and Practice (e-journal). 1779. University of Nebraska-Lincoln. Retrieved from [http://digitalcommons. Unl.edu/libphilprac/1779](http://digitalcommons.Unl.edu/libphilprac/1779).
- Nadeem, M., Ali A., Maqbool, S. and Zaidi S. (2018). Impact of anxiety on the academic achievement of students Having differential mental abilities at university level in Bahawalpur (Southern Punjab) Pakistan. *International Journal of Educational Sciences*, 4(3) pp519-528.

- Nail, J., Christofferson, J., Ginsburg, G., Drake, K., Kendall, P., McCracken, J., & Sakolsky, D. (2015). Academic impairment and Impact of treatment among youth with anxiety disorders, *Child and Youth care forum*, 44(3), 327-324. Doi: 10.1007/s 10566-014-9290-x
- Nayar, A. (2018). Teaching and learning in Technology Empowered Classrooms-Issues, Contexts and Practices. Partridge Publishing.
- Newman, S. (2016). Literacy in the Television Age. Noewood: Ablex Publishing Company.
- The Nielson Company. (2017). Nielson Social Media Report 2016. Retrieved From <http://www.nielson.com/us/en/insights/reports/2017/2016-nielson-social-media-report.html>.
- Numan, A., & Hasan, S. S. (2017). Effect of Study Habits on Test Anxiety and Academic Achievement of students in Ghanaian Universities: A case study of University of Ghana, Legon. Library of Undergraduate Students. *Journal of Research & Reflections in Education (JRRE)*, 11(1).
- Niemz, K., Griffiths, M., and Banyard, P. (2005). Prevalence of Pathological Internet Use Among Students and Correlations with Self-esteem, the General Health Questionnaire (GHQ), and Disinhibition. *Cyberpsychology and Behaviour*, 8(6), 562-570.
- Ngounmandjoka, U.T (2014). Correlation between Internet Usage and Academic Performance Among University Students. (Doctoral dissertation).
- Omachonu, C. G., and Akanya, J., (2019) “Effects of social media on the academic achievement of the students: A case study of the Aayigba, Nigeria” *International Journal of English Language Teaching*, vol. 7, no. 5, pp 14-23, 2019.
- Patel, V. and others, (2016). Addressing the burden of mental, neurological, and substance disorders: Key messages from Disease Control Priorities. *The Lancet*, 387(10028), pp1672-1685.
- Pontes, H, M. (2017). Investigating the differential effects of social networking site addiction And Internet gaming disorder on psychological health. *Journal of Behavioural Addictions*. <http://dx.doi.org/10.1556/2006.6.2017.075>.
- Punch, K. F. (2014). *Introduction to social research*. Washington, DC: Sage Publication.
- Sigmund, T. (1985) Test Anxiety: Interference, Defective Skills, and Cognitive Capacity pp135-1
- Stein, M.B. and Sareen, J (2015). Generalized Anxiety Disorder. *New England Journal of Medicine*, 373, 2059-2068.
- Steinmayr, R., Meibner, A., Weldinger, A.F. and Wirthwein, L. (2017), Academic Achievement. Oxford Bibliographies. Retrieved 7/3/19 from <http://oxfordbibliographies.com/view/document/060978199756810>.

- Suresh, K. (2016). A study on anxiety level and academic performance of X1 Standard Students. Thanjavur District. *The International Journal of Indian Psychology*, 3(4)57.
- Thorisdottir, I. E., Sigurvinsdottir, R., Asgeirsdottir, B. B., Allegrante, J. P., and Sigfusdottir, I. D. to their problem-solving ability and examination anxiety. *International Journal of Indian Psychology*, 3(4), 66.
- Tuckman, H.P, (2018) Teacher effectiveness and students' performance. *Journal of Economic and Education* 7(1).34-39.
- Turel, O. and Qahri-Saremi, H. (2016). Problematic use of social networking sites: Antecedents, University of Kenya. *International Journal of Scientific and Research Publications*, 9(5), 850-865.
- Turel, Y. K., and Toraman, M. (2015). The Relationship between Internet Addictions, with Success of Secondary School Students. *Anthropologist*, 20(1), 280-288.
- Von de Emse, N.P., Jester, D., Roy, D., (2018). Post J Test anxiety effects, predictors, and Correlate A 30-year meta- analytic review. *Journal of Affective Disorders*, 227, 483-493. Doi: 10. 1016/j.jad.2017.11.048.
- West African Examinations Council (2018). WAEC senior secondary certificate Examinations' grading system. <https://www.primetimes.com.ng/waec-grading-syst>
- Yeap, J.A.L., Ramayah, T., Halim, H.A., Ahmad, N.H., and Kurnia, S. (2016). Exploring the Youth with anxiety disorders. *Child & Youth Care Forum*, 44(3), 327-342.



## THE CONTRIBUTIONS OF FEMALE SCHOLARS MODIBBE TO THE GROWTH OF ISLAMIC AND MUNDANE KNOWLEDGE AMONG THE FEMALES IN SOKOTO CITY IN THE 19TH AND 20TH CENTURIES

**Nabilah Lawal Bako**

Department of History,  
Faculty of Arts,  
Sokoto State University, Sokoto.  
Email: [nalahbako887@gmail.com](mailto:nalahbako887@gmail.com)

---

### Abstract

*This study examines the contributions of female scholars Modibbe to the growth and development of female education in Sokoto city in the 19th and 20th centuries. It is a historical study that uses qualitative content analysis of the existing literature and intensively discusses the emergence of Modibbe and the dispensation of knowledge to their female folk. Both primary and secondary sources contained in the materials were perused, analysed, evaluated and interpreted. The data collected was analysed through corroboration in order to arrive at informed opinions and judgments. The findings in the study indicate that the dearth of female scholars in the society was what triggered the advocacy of female education prior to the break of the Jihad. Through massive campaigns and advocacies, the Jihad leaders introduced a female education policy known as Yan'taru that was championed by Nana Asmau after the establishment of the caliphate, which resulted in the emergence of a significant number of Modibbe at the nook and crannies of Sokoto.*

**Keywords:** Female Education, Islamic and Mundane knowledge, Modibbe and Sokoto city

### Introduction

Before the coming and spread of Islam in most societies in the regions of western Hausaland, formal education was not in existence. What perhaps Fafunwa refers to as the informal traditional African education system passed orally from parents to their siblings through informal methods dictated by the nature of their crafts and occupation (Fafunwa, 1989:9). Before the Jihad of 1804, which took place in the region where Sokoto city later grew, the females in the area (defunct Gobir kingdom) had rightful and prestigious positions as the custodians of useful knowledge on many issues concerning their natural environment and the people inhabiting them. It was through this system that the female folk in the kingdom mastered quite a number of knowledge and skills as traditional birth attendants, female herbalists, female priestesses, female crafts workers and even political affairs of the kingdom as Mother of the kingdom (Inna of Gobir) (Yandaki, 2018:1-2). The introduction and spread of Islam in the area, was the beginning of a formal system of education through the aid of wandering proselytizing scholars and Muslim traders that came through trans-Saharan trade routes (Junaidu, 2000:3). It should however be noted that the involvement of female at this stage was minimal in the view of the peripatetic nature of the scholar's mobility which was part of the learning process could not be

applied to women, thus education at this stage was gendered (Junaidu, 2000). Kware assert that it was the activities of Sheikh Usman bin Fodiyo that changed the status quo in the entire Hausaland, as he insisted on female education for female but also emphasized the importance of imparting them secular instructions connected with business transactions (Kware, 2014:15).

### **Statement of the Problem**

Scholars across the globe have written much on the Jihadists and the contributions of their children in the jihad movements as well the establishment and growth of the Caliphate. The most outstanding and remarkable contributions to female education was that of Nana Asma'u, the daughter of Sheikh Usmanu. Asma'u left no stone unturned in the pursuit and advocacy of female education in the Caliphate. Her role and contributions have been studied and documented by numerous scholars across the globe. There is insufficient knowledge of other notable scholars in Sokoto city who have contributed in expanding the frontiers of female education in the city. The apparent neglect of the study of other prominent scholars Modibbe warrants the current initiative to carry out the study. Secondly, there is misconception about the roles and contributions of the Modibbe in advancing not only the basic Islamic knowledge of Quran and Hadith but also other branches of knowledge such as the mundane knowledge that comprise of business transactions, business and vocational skills, home management and nutrition, personal and environmental hygiene among others.

### **Aim and Objectives of the Study**

The broad aim of this work is to examine the roles and contribution of Modibbe to growth of female education in the Sokoto City. The specific objectives of the study are as follows:

- I. To identify the prominent Modibbe who advocated for female education in Sokoto City,
- II. To assess the major roles of the Modibbe in the advocacy for female education in Sokoto City.
- III. To examine the extent of the branches of knowledge instructed to female students.
- IV. To examine the outcome and impact of the knowledge imparted to the female folk and the society at large.
- V. To evaluate the Yan'taru system of education which was introduced by Nana Asma'u after the 19th century Sokoto Jihad movement

### **Research Questions**

- I. Who were the prominent Modibbe that advocated for female education in Sokoto City?

- II. What were the major roles of Modibbe in the advocacy for female education?
- III. What were the other branches of knowledge instructed to women?
- IV. What were the outcome and impact of the Modibbe teachings on female folk and to the society at large?
- V. What were the results of the Yan'taru system of education towards achieving female education in the city

### **Significance of the Study**

The study serves as a mirror through which the lives of people and their efforts could be understood. In understanding the prevalence of female folk in the teaching profession in Sokoto today, it is important for one to understand the significant role of female scholars Modibbe in the pursuit, advocacy and dispensation of Islamic and mundane knowledge among the female folk in the 19th and 20th centuries. Therefore, this study is important because it serve as a valuable contribution to the frontiers of Islamic and mundane knowledge. It is an additional research material to be used by scholars and students. And its opens a new vista in historical discourse on female education and vocational skill acquisitions, which is of immense benefit to policy makers, researchers and the society at large.

### **Conceptual Clarification**

The key concept used in the study include: Female Education, Islamic Knowledge, Jaji, Moddibe, Mundane Knowledge, Sokoto City and Yan'taru.

**Female Education:** Female education a kind of knowledge given to the female folks, it may be informal or formal. It involves the female gender, who received a particular form of education aimed at improving their knowledge and skills (Mamman, 1995).

**Islamic Knowledge:** Simply refers to the knowledge of Islamic religion. It is a kind of that believers who believe in Allah being the Supreme God and Prophet Muhammad (P.B.U.H) his Messenger indulge themselves into so as to worship God and strictly abide by its principles and teachings (Jagaba, 1996).

**Jaji:** is the singular while Jajis (plural). The word Jaji is referred to as a senior scholar of a or of a school from the outlying towns and districts (Boyd, et al, 1999:133-135). It is an official title in the organizational structure as well as leadership operation of the Yan'taru. The title is conferred to the most educated and dedicated Modibbe, who demonstrated their abilities were chosen and crowned as Jajis. Jaji presided over all matters relating to instruction, movement and activities of her students contingent to and from Sokoto (Omar, 2014:4).

**Modibbe:** is the plural of Modibbo, a Fulfulde term which refers to a group of learned Islamic persons, scholars or teachers. In Sokoto, the concept Modibbo usually refers to a female scholar. This is why the above study will maintain the status quo, by referring to female scholars as Modibbe. Literally, Modibbe could also mean erudite teachers or

scholars who teach and help students to learn and acquire knowledge, competence or virtue. Modibbe are versed in Islamic knowledge, intellectual activities, trained in Islamic law and interprets Islamic sciences and doctrines. (Malami 2021). The meaning of the name Modibbo invokes firmness, creativity, generosity, loyalty and a core for domestic life (Modibbo, et al, 2021).

Mundane knowledge: means worldly, earthly, profane, vulgar as opposed to heavenly knowledge. The fact of knowing about something; general understanding or familiarity with a subject, place, situation etc. It refers to the knowledge of something relating to or characteristics of the world. [www.powerthesaurus.org]. It is the knowledge of the immediate concerns and daily activities of human beings (Webster, 2000). The study defines it as the general day to day knowledge of for human survival.

Sokoto City: The city was named and established by Muhammad Bello in 1809 as the capital of the defunct Sokoto caliphate. It served as a provincial headquarter during the colonial rule, a capital of the defunct north Western States and the capital of modern day Sokoto State. The city is located in the extreme northwest of Nigeria near the confluence of Sokoto River and Rima River (Isa, 2013).

Yan'taru: The concept derived its name from the Hausa word "Taru", meaning a cluster or congregation of people (Boyd, 1995). Omar (2014:1) believes that the concept of Yan'taru which later became to be identified with a popular women mass education and community participation programme initiated by Nana Asmau derived its name from the fulfulde word "taroje", and in Hausa "taro", which means study group or reading cluster base on this study. Yan'taru is therefore, a mass education programme organized or designed for women to enable them practice their religion as well as participate and contribute towards the development of the society (Mairiga, 1995).

## **Review of Related Literature**

One of the significant works related to the study is the work of Omar that examines the literary songs composed by prominent female Scholars in the Sokoto Caliphate. The Scholars converted most of their teachings (religious, historic and mundane messages) into written songs, composed to educate and preserve the history of the Caliphate. The Author states that learning through this medium became more comprehensible, easier, faster and motivational (Omar, 2021). However, the work focused on only their literary songs as their major contributions. Perhaps this made this study to examine and outline other contributions apart from the literary songs made by the prominent female Scholars to female education in Sokoto city.

In a book of three chapters that gives a brief biography of Nana Asma'u and the evolution, roles and functions of Yan'taru (Associates). The author enumerates a number of Yan'taru songs and examined the messages contained therein (Omar, 2014). The book is very useful to the study as it outlines the structure of the mass education programme and how it was coordinated. However, the methodology involved in disseminating the knowledge as well as the example of a particular Jaji was not mentioned. Mention was only made of the founder and co-founders of the association (Asma'u, Maryam and Tamodi). Therefore, it is the aim of the study to identify the methodology involved in dispensation of knowledge as well as some prominent scholars and officials of Yan'taru.

In another study, Omar (2017), gave an account on the importance of female education in Islam. The author discusses the emergence and brief biography of female scholar in 19<sup>th</sup> and 20<sup>th</sup> centuries, which have served as a background study to the paper. In the same vein, Kware (2014), also made an attempt to discuss on the importance of female education during and after the Sokoto Jihad. He further examines the activities of Yan'taru as well as extracted out prominent female scholars in the pre-Jihad period in most of Nana Asma'u poems.

Boyd (2004) gave an insight narration on the role of educated women in Sokoto caliphate particularly the spouses and daughters of the Sheikhs. Her visits to their respective domains enabled her to compile a comprehensive profiles and scholarly contributions they rendered. She got the privilege to interview one of the contemporary Modibbo of the Sheikhs' lineage, known as Modibbo Kware, the great-great granddaughter of Isah Mai Kware (the youngest son of the Sheikh) who at the time was the head of Yan'taru in Kware and Wurno districts.

Bawa (2019) examined the historical narratives of women's contributions to education in northern Nigeria, which she analysed in tripartite structures: the pre-colonial, colonial and post-colonial. She argued that Nana Asmau scholarly position and intellectual contribution to the development of women education were the major factor for the solid foundation of women education in the region.

From the above literature reviewed so far, all have discussed adequately the importance of female education, and the role played by prominent female scholars in the advocacy and development of female education in general. However, none of the above have attempted to point out that, in the course of disseminating such education to the female folk, there were specific mundane knowledge imparted to students such as business transactions, midwifery, craft and vocational skills, home management, personal and environment hygiene, to which may be seen as another significant landmark as far as formal education is concerned in Sokoto in the 19<sup>th</sup> and 20<sup>th</sup> centuries.

### ***The Emergence of Modibbe and Female Education in Sokoto City***

Education whether to female or male, Islamic, western or general knowledge becomes the aggregate of all processes by which the receiver develops the ability, attitude and other modes of behaviour which are of positive value to the society in which he/she lives in (Junaidu, 1991). The advocacy for female education has been emphasized by Islam as it does not discriminate between sexes in the quest for knowledge. The Prophet (PBUH) has emphasized the need for female education. He personally taught females especially, his family and those of his companions; which resulted in the emergence of female scholars like Aisha, Hafsa, Ummu Salmah (his spouses) and others like Fadimatu daughter of the Prophet, Nafisah (great granddaughter to the Prophet (PBUH)), Juwairiyah Bint Ahmad, Umm Waraqah, Hind bint Assed, Ummu Hisham Bint Harith, Zaidali Bint Hayyan, Umm Sa'ad bint Sa'ad among many others (Ghandanfar, 2001). These scholars played significant roles in educating other females and even the males in their societies. For instance, Ibn Hajar Al-Asqalani studied the hadith under Juwairiyah Bint Ahmad and the famous hadith scholar Imam Shafi'i studied under Sayyada Nafisah (great granddaughter to the Prophet (PBUH)) (Ghandanfar, 2011).



Similarly, same applies to Hausa land, a few numbers of female scholars emerged as a result of the spread of Islam in Hausa land. The jihadists during their revolutionary write ups and documentation mentioned few female scholars who have migrated from Senegambia to Hausa land. The migrants who were of Torobde clan, settled and began their scholarship activities in Hausa land (Omar, 2013). In fact, Muhammad Bello mentioned in his book *Infaq-Al Maysur fi Tarikh Bilad - al Tukrur* of a female scholar known as Ummu Haani, whom he described as a prominent scholar of her time, a well learned, pious and faithful woman of God from Torobde clan. Ummu Haani was said to have prophesized the coming of Shehu Danfodiyo as an Islamic reformer even before he was born, that he would change the course of Islam and its teaching in Hausa land. Ummu Hanni's contemporaries were said to have been the grandparents of Sheikh Bin Fodiyo from both paternal and maternal side known as Rukayya and Maryam (Bello, no date). Both are known to be well learned in Quran, Hadith, Figh, Arabic language and others. These two women had educated a number of females during their time (Asma'u, no date). This has proven the statement made by Adamu that women are responsible for the upbringing of their children who will be leaders of tomorrow, thus their formative years should not be marked by misguidance of ignorant mothers (Adamu, 1982). In this regard, Sheikh was blessed with scholarly parents and grandparents who in so many ways paved way for his scholarly activities.

Hauwa'u bint Muhammad (Sheikh's mother) was a learned Islamic scholar and teacher, she taught many women and children in her compound (Yar'dubu, 2021). Other notable female scholars that were related to the Sheikh included the following: Aminatu - a prominent scholar and grandmother to Waziri Gidado. Hassanatu - a prominent scholar and maternal grandmother to Waziri Gidado who hails from the Galanko'en Fulbe clan from Futa-jallon. Hassanatu and Inna Kabo - they were wives to Mallam Adamu and Muhammadu Hajji, the Sheikhs Uncles, who were also versely learned and both engaged in teaching and studies of Islamic books. Habiba - a prominent scholar of her time, was one of the daughters of the Sheikh Usmanu's Uncle. She established a learning session in her family compound and extended to her matrimonial home in Galmi. She was quoted in one of Nana Asma'u's song titled *Tawassuli ga Mata masu Albarka'* as a gentle, pious and educated lady who has passion for teaching and learning (Omar, 2021). Distant relations including Ja'aibatu, Amina Lubal and Amina, daughter of Ade were all prominent scholars who engaged in teaching and learning of Islamic books to younger children and women. The above categories of scholars were said to have taught the Sheikh's children and those of his companions (Omar, 2021).

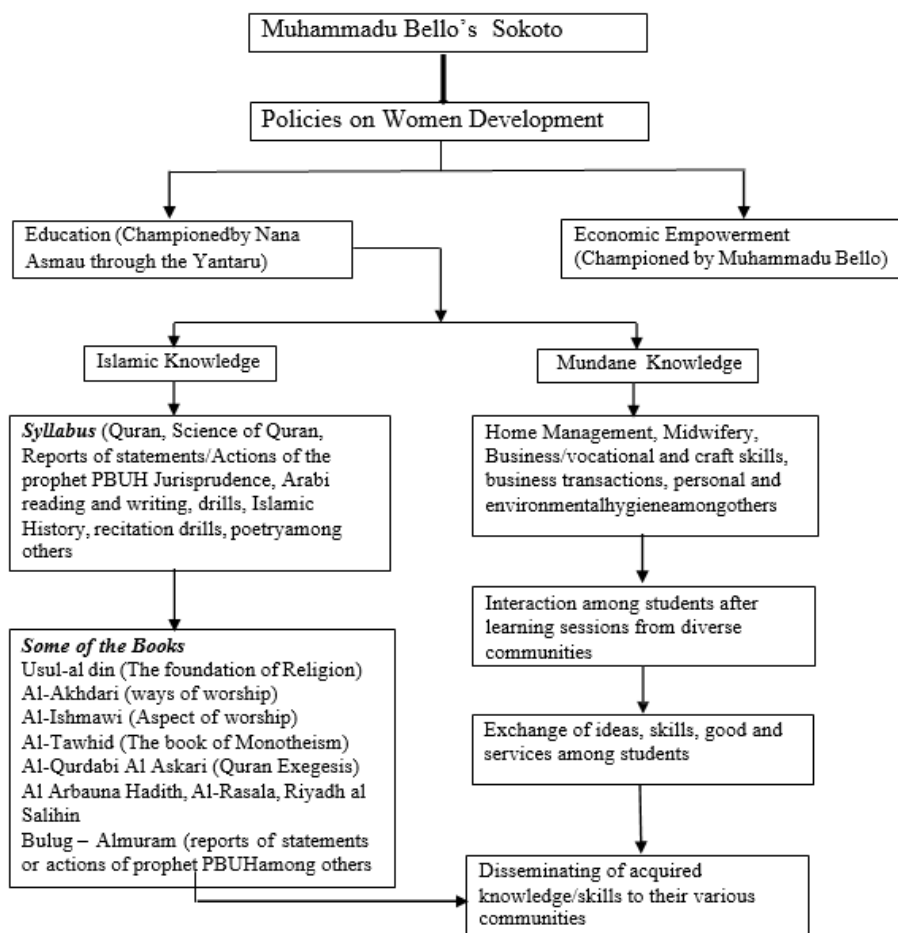
The learned spouses of the Sheikh include: Maimuna, Hauwa'u and Aishatu Gabdo. They were at the forefront in massive advocacy for female education during and after the Jihad of 1804. They played significant roles in dissemination of knowledge to their children and community at large through learning sessions they conducted in their compounds. They served as mediators and advisers to women especially when a rift arose between co-wives, mother's in-law and daughter's in-law and others (Omar, 2021). Apart from the above scholars, the Sheikh's female children also played significant roles in the advocacy, dispensation and awareness on the importance of female education during the peak and after the Jihad movement. Prominent scholars among them were Khadijah, Fadimatu, Nana Asmau and Maryam (Boyd, 1989). Their contributions to female education and the Jihad itself was outstanding which superseded that of their female predecessors. Even



after the Jihad, their literary works and teachings (legacies) still exists. The most remarkable is the formation of Yan'taru by his daughter Nana Asma'u (a mass education programme targeted to teach young and old women) within and beyond the city of Sokoto. This system of education yielded and is still yielding immense benefit to the society at large (Mairiga, 1995).

Another set of scholars who were contemporaries with the Sheikh's children included his nieces and granddaughters such as Aisha bint Abdullahi, Aisha Bint Buhari, Fatima Bint Muhammadu Bello, Aishatu (Utiya) bint Muhammadu Sambo, Fadimatu Janejo Bint Mustafa Al-Torodi & Maryam (Tamodi); bint Abdulkadir Adde (Boyd, 1989). It is important to note that even in the late 19th and early 20th centuries, there were female scholars who continued to revive the tradition of teaching and learning that the jihadists, their families, relations and companions initiated. The Yan'taru system of education that was hitherto stationed at Nana Asma'u's matrimonial home relocated to Hubbaren Shehu, (Sheikh's house) after the demise of Asma'u in 1864. At Hubbare, Maryam continued to lead the affairs of Yan'taru until her demise in 1890 when her daughter, Ta Modi continued to head the activities of Yan'taru. It was after the death of Ta Modi that the affairs of Yan'taru changed a new course in its management. The title of Modibbe began to be used officially to address of female scholars that continued to run the affairs of Yan'taru at Hubbare. Modibbe continued the teaching and learning tradition at Hubbare. While many others established schools in their homes and began to teach women and children. Prominent among the Modibbe included: Aisha Dudu bint Abdullahi, Dikko bint Ahmad Gwandu, Hafsatu Bint Mani, Modibbo Maryamu, Modibbo Mowa, Modibbo Audi, Modibbo Nana, Modibbo Yar'Ali, Modibbo Dije,

Modibbo Ladi, Modibbo Ige, Modibbo Hauwa Mammange, Modibbo Saudatu Bint Mahmud. (Modibbo Kilo), Modibbo Lamido Kilo, Modibbo Safiya and Modibbo Hajara bint Isah Mai Kware, Modibbo Sume, Modibbo Jumma, Modibbo Amo, Modibbo Yarmamma, Modibbo Yardubu, Modibbo Koko and others (Modibbo, 2021).



**Figure 1:** Nana Asma'u/Yan'taru's Instructional Model (Bako, 2021)

The above instructional model showcases the strategy and patterns of educational instructions implemented by Nana Asma'u and Yan'taru. It is important to note that Yan'taru is a mass education programme organized and designed for women with education to enable practice their religion and relate well with the society. As indicated in the above chart. Hence, this system of education attracts students from far and within to converge for learning. Ideally, the students' contingents come in troops along with male escorts. Each contingent has a female leader who may have been crowned as Jaji. The student contingent comprises of elderly women and younger females who are about to get married. They came along with items such as guinea corn, millet, sorghum, spun thread, hand fans, coverlids, hats, calabashes, fermented mills, butter, money and other items as goods to be sold as well as alms to be given to their tutors. The commodities for sale are meant to be traded with colleagues and other people in the area only after learning sessions (Boyd, 1985) cited in Omar (2014).

Although the Yan'taru organisation was principally geared towards women's education in Sokoto, undoubtedly, it exposed the women to various entrepreneurial skills and ventures in many ways. One of such ways was their training sessions during the programme. Secondly, student contingents of different areas and religions met in one place, and there is the possibility of proliferation of ideas, skills and innovations among the students. This is because each area or region had its specialty in crafts, trade, and production of goods

and services. This aided the exchange and commercialization of goods and services among the women and community at large. And at the end of their learning sessions, Jajis and students returned to their communities and taught their women folk both the Islamic and mundane knowledge they had acquired. These no doubt made women to be self-developed and contribute toward the socio-economic growth and development of their societies.

### ***An Assessment on the Modibbe: Their Roles and Contributions***

The contributions of female scholars and Modibbe through the advocacy, pursuit and dispensation of female education has been a significant achievement throughout history. Their commitments and zeal in establishing schools in their homes and participating actively in running the schools with syllabus like Quran, Science, of the Quran Figh, Hadith, Arabic drills and Islamic history among others is no doubt a great sacrifice. In fact, maintaining that aged long tradition of learning and teaching for decades is commendable. Their literary works have played immense role in teaching and enlighten people on the history of the past, religious obligations, Islamic shari'ah, and mundane issues, in form of songs and poems, written documents as pamphlets and books in Fulfulde, Arabic and Hausa languages which ensured a wide coverage of audience and readers (Mukhtasar, no date). Similarly, their efficiency and dedication towards translation and preservation of works written by the Sheikh and other scholars into Hausa and Fulfulde languages, made it easier for their accessibility and understanding. Through these medium, many people were enlightened and educated. Moreso, it was through their hard work and effective service delivery that a number of Sheikhs and Mallams were produced. For example, Nana Asma'u taught Isah Maikware her younger brother, Isah's granddaughter Modibbo Hajara taught Modibbo Hauwa Mammange who also taught Waziri Junaidu. Modibbo Saudat (Modibbo Kilo) was the teacher to the scholar Sheikh Sidi Attahiru and Qadi Usmanu Gusau. It was through the activities of the Modibbe that the spread of Islamic education became rapid in the mid-20th century and a number of Islamic scholars (male and female), a number of Islamic schools and Islamic books increased and their relevance cut across all dynamics.

Again, their advice and guidance and basic Islamic Shariah rulings has molded most of their students into good administrators. Modibbe play vital roles as arbiters and advisers on issues regarding the administration as some were asked to intervene in matters concerning polices on general well-being of women. Nana Asma'u and Maryam Bn Fodiyo intervened in politics in Sokoto and Kano respectively. Their teaching sessions and schools served as an avenue where vital information and administrative policies are conveyed to students.

Moreso, the Modibbe did not only impart the basic Quran, Hadith, Jurisprudence and other Islamic theologies to women and children, mundane knowledge was also taught and encouraged. Business education, rules guiding business transactions craft and vocational skills among others were taught because majority of the women were involved in one form of trade and skills or another, and trading among students took place after learning sessions were over. Likewise, instructions on midwifery, home management, importance of health and its management, personal hygiene as well as environmental hygiene were taught among students because the responsibility of houses and cooking of foods all rest

on the women who were the dominants in the schools. This kind of instructions seems to be foundations of formal entrepreneurship education in a typical Islamic school setting.

## Conclusion

Female education is no doubt the key that unlocked the potentialities of women as good teachers, scholars, arbiters, counsellor, craft business woman, wives and mothers. The contributions of Modibbe since the pre-jihad period served as background for the current educational positions by women. The Modibbe left no stone unturned in education, preservation of history, translation of literary works of their predecessors, advocacy and quest for female participation in educational engineering team, to produce learned scholars who will continue the aged long tradition of teaching and learning in the modern times. Some of Modibbe became among the pioneer teachers of modern schools when western education was introduced in Sokoto because of their literacy in reading and writing. Examples Modibbo Sodangi, Modibbo Ige, Modibbo Boya, Mallama Dije, Mallama Hauwa Yabo, and Mallama Abu. These were the pioneer female teachers of the Gidan Haki vocational school established in 1934 in Sokoto metropolis.

## References

- Adamu, A.R. (1982). "Women Education in Sokoto State: A Preliminary Empirical Analysis and Some Policy Recommendation" in the *Farfaru Journal of Mutli- Disciplinary Studies* (3).
- Asma'u, N. (no date) *Qasidatu Dhikir Ba'adi Waliyatin min al-Nisa'i min Zaman Rasu I' Shehu (Labara lilahi (A praise song for pious women since the time of the Prophet Muhammad (P.B.U.H). And Ko'iwii' Shaihu: Zuri'ar Shehu). Manuscript.*
- Bako, N.L. (2021), 'The Role of Female Scholars and Female Entrepreneurs in Sokoto City in the 19<sup>th</sup> century'. Being a postgraduate seminar presentation, department of History, Bayero University Kano, November.
- Bawa, A. B. (2019), "Historical Narratives of Women's Contributions to Education in Northern Nigeria", *International Journal of Language Literature and Gender Studies*, Laligens, Bahir Dar Ethiopia, Vol. 8(1) Serial no. 17, February.
- Bello, M. (no date) *Infaq- Al Maysur Fi Tarikh Bilad-al Takuru. Manuscript.*
- Boyd, J and B. Mack (1999). *The Collected Works of Nana Asma'u Daughter of Usmanu Danfodiyo (1793-1864)*, Ibadan, Sam Bookman Publishers.
- Boyd, J. (1989). *The Caliph' Sister: Nana Asma'u 1793-1865 - teacher, Poet, and Islamic Scholar*, London, Frank Cass.
- Boyd, J. (1995), *Asma'u and Yan'taru: A Concept of Women Leadership in Hausa*

Environment (in) *Zaruma: A Cultural Magazine of Sokoto State Council of Arts and Culture*, Sokoto, 6<sup>th</sup> edition.

Boyd, J. (2004) "The Role of Educated Women in Sokoto Caliphate: Nana Asmau, 1793 – 1865" in Sokoto Caliphate, *History and Legacies 1804 – 2004*, Vol. 2 eds. H. Bobboyi and A. M. Yakubu, 2004, International Conference, Sokoto Caliphate Bicentenary Celebration, Abuja, Nigeria.

Fafunwa, B. (1982) "African Education in Perspectives" in *Education in Africa, A Comparative*, eds. London,

Ghandanfar, M.A. (2001) *Great Women of Islam*. Darussalam, Riyadh, Saudi Arabia.

Isa, I.U. (2013). *Metropolitan Sokoto: Issues in History and Urban Development since 1960*.

*Gaskiya Corporation Limited*.

Jagaba, M.M. (1996), "Islam and Girls Education" Being a Paper presented at a Zonal Workshop organized by Ministry of Education Sokoto State, at Giginya Hotel Sokoto, 7<sup>th</sup> - April, 1996.

Junaidu, M. I. (2000) "Themes and Trends in Educational Development in the Sokoto Caliphate", paper presented at a Seminar to Mark Change of Nomenclature, Emirate to Sultanate held at Giginya Hotel, 8<sup>th</sup> July

Junaidu, M.I. (1991). "Basic Education in Sokoto State: A Situation Analysis of Federal Republic of Nigeria in Conjunction with UNICEF". Ministry of Education Sokoto.

Kware, B.B. (2014) *Contemporary Challenges of Female Education in Sokoto Emirate*, Gaskiya cooperation, Zaria.

Mairiga S.M. (1995), "Maryam bint Al-Sheikh Uthman Danfodiyo: Her Life, Works and Contributions in the Socio-Religions and Political Development of Sokoto Caliphate in *Tarihi Journal*, Vol. 1.

Malami, H.U. (1998). *Economic Principles and Practice of Sokoto Jihad Leaders*, Center for Islamic Studies, Usmanu Danfodiyo University Sokoto.

Malami, H.U. (61 years), Oral interviews, a scholar on Sokoto Caliphate, interviewed in Mana area Sokoto, 12/08/21, 4: 37pm.

Mamman, A. (1995), "Women Education in Nigeria, Problems and Prospects". *Gusau Journal of Education* 1(3)

Modibbo, et al (2021) This response was derived through the conduct of interview sessions with a number of female teachers *Modibbe* at *Hubbaren Shehu*, Sokoto.

They include: *Modibbo* Aisha, 68 years. *Modibbo* Ige, 75 years. *Modibbo* Hussaina, 71 years. 30<sup>th</sup> July, 2021 at 4:48pm.

Mukhtasar, A (no date) Examples of their literary works - Khadijah (on Sufism, Figh, Arabic grammar titled -*Katarunnada*, translated *Mukhtasar Al Khalil to Fulfulde*, Songs on Prayers, Preaching's, Historic events among others)

Nana Asma'u (no date) *Ko'iwii' Shaihu: Zuri'ar Shehu*, *Manuscript*.

Nana Asmau (no date) *Qasidatu Dhikir Ba'adi Waliyatin min al-Nisa'i min ZamanRasu I' Shehu* (Labara lilahi (A Praise Song for Pious Women since the time of the Prophet Muhammad (P.B.U.H). *Manuscript*.

Ogunbiye, I.A., (1969). "The Position of Muslim Women as Stated by Usmanu bn Fodiyo" In *ODU: A Journal of African Studies*, No. 9 October.

Omar, S. (2013). *Modibbo Kilo (1901-1976) Rayuwar ta da Ayyukan ta (Tabiyu ga Nana Asma'u Bin Fodiyo*. Ahmadu Bello University Press Limited, Zaria, Kaduna State.

Omar, S. (2014). *Yan'tarun Nana Asma'u Danfodiyo: Tsarin Su da Taskace Wakokin Su*.

ZEETMA Investment Limited Kaduna.

Omar, S. (2017), *Malamai Mata A Daular Usmaniyya A Karni Na 19 Da 20*, Ahmadu Bello University Press, Zaria Kaduna.

Omar, S. (2021). "*Fitatun Malamai Mata na Daular Usmaniya da Gudummuwar su A Fanin Rubutaciyar Waka a Karni Na 19 Da 20*. Being the 25<sup>th</sup> Inaugural Lecture, presented at Usmanu Danfodiyo University, Sokoto. 5<sup>th</sup> August 2021, UDUS Auditorium Main Campus. 4: 00pm.

*Modibbo* Aisha, 68 years. *Modibbo* Ige, 75 years. *Modibbo* Hussaina, 71 years. 30<sup>th</sup> July, 2021 at *Hubbaren* Shehu, 4:48pm.

The response was derived through Oral interview sessions at *Hubbaren* Shehu with *Modibbo* Yar'dubu, *Modibbo* Saude and some female care takers (Maidaki-Hadiza and Inno). On 23<sup>rd</sup>/August/21, 5:18pm.

Yandaki, U.A. (2018). "Traditional Medicine and Sciences: The Contemporary Participation of Hausa Women in the Indigenous Knowledge System". Being a paper presented at the first Women in Education Conference, Organized by Waziri Junaidu History and Culture Bureau Sokoto in Collaboration with United States of America Embassy Abuja Nigeria on the theme "Women's Contribution to Education and Literature in Northern Nigeria" at Umaru Ali Shinkafi Polytechnic Auditorium, from 20 - 21<sup>st</sup> June.

Yar'dubu, M. (88 years), oral interview at *Hubbaren* Shehu Sokoto 30 August, 2021, 5:17pm.



## PERCEPTION OF NCE BIOLOGY STUDENTS TOWARDS INCORPORATION OF DIGITAL TOOLS FOR E-LEARNING IN FEDERAL COLLEGE OF EDUCATION, ZARIA

**Alafiatayo Bunmi Mercy & Dauda Nana Oziehisa**

Department of Biology,  
Federal College of Education, Zaria  
Email: [bumercyalafiatayo@gmail.com](mailto:bumercyalafiatayo@gmail.com)

---

### Abstract

*The study focused on Perception of NCE Biology Students towards Incorporation of Digital tools for E-learning in FCE, Zaria. Four research objectives, and four research questions guided the study. Descriptive survey design was adopted for the study. The sample for the study comprised of three hundred and six (306) biology students drawn from the population of study using random sampling techniques. The instruments for data collection in this study was a questionnaire and data was analyzed using mean, and standard deviation. The results revealed that notably positive perception among biology students regarding the incorporation of e-learning into their academic programs, factors such as positive prior experiences with e-learning had shaped their attitudes positively, alignment between students' personal learning preferences and e-learning formats played a pivotal role in shaping their attitudes, among others, there is high willingness of biology students to actively participate in e-learning courses and activities, and challenges and barriers faced by biology students during the transition from traditional classroom learning to e-learning platforms were also revealed. Based on the findings, the researcher recommends that educational institutions should invest in robust technical support to address the technical issues and connectivity problems that students encounter during e-learning among others.*

**Keywords:** Perception, NCE, E-learning, Incorporation, & Digital tools

### Introduction

The rapid evolution of Information Technology (IT) has brought about significant transformations across various facets of life, with education being a prominent domain that has witnessed profound changes in teaching and learning methodologies. The advent of state-of-the-art technologies has expanded beyond the traditional confines of physical classrooms, giving rise to the era of e-learning. E-learning, a term that gained prominence in the mid-1990s, encompasses a wide range of educational practices facilitated by electronic media. Some scholars define e-learning as the delivery of instructional content through electronic channels, including the internet, intranet, extranet, satellite broadcasts, audio/video tapes, interactive TV, and CD-ROMs (Engelbrecht, 2015). Others perceive it as a form of internet-based education leveraging web-based communication, collaboration, knowledge dissemination, and training to enhance individual and organizational capabilities (Kelly & Bauer, 2014).

This research seeks to explore students' perceptions of e-learning, recognizing them as the primary beneficiaries of this technology-driven educational paradigm. Understanding their opinions and perspectives is crucial as their experiences and feedback play a pivotal role in shaping the future of teaching and learning. The study aims to delve into students' attitudes, preferences, and apprehensions related to e-learning, shedding light on their unique insights into this transformative mode of education. Universities worldwide, including those in Sweden, India, and the United States of America (USA), have harnessed the potential of e-learning to make their educational programs globally accessible. This shift allows students to enroll in various academic programs without the need to relocate, eliminating geographical constraints. Illustrative examples include the MSc. Information Security offered by Luleå University of Technology, the Master's Programme in Information and Communication Technology for Development by Stockholm University, and the MBA program at Blekinge Institute of Technology. The University of the People in the USA offers fully online programs in Business Administration and Computer Science (University of the People, 2015), highlighting the growing significance of e-learning in modern education.

Specialized IT platforms such as Coursera ([www.coursera.org](http://www.coursera.org)) and EdX ([www.edx.org](http://www.edx.org)) have empowered universities globally to extend their programs through e-learning initiatives. These platforms serve as conduits for universities to reach a diverse global audience with a wide range of programs. Noteworthy institutions, including Nanjing University, Vanderbilt University, Australian National University, Cornell University, National Taiwan University, and the University of Tokyo, have utilized these platforms to offer their educational offerings to a broader student base (Coursera, 2015; EdX, 2015), emphasizing the transformative potential of e-learning in transcending geographical boundaries and expanding educational access.

In Nigeria, with a comprehensive educational landscape comprising 97 institutions, e-learning initiatives have the potential to revolutionize education. The adoption of a 'distance education model' has been instrumental in enhancing access to education, particularly for individuals facing geographical constraints. Efforts by institutions like the University of Ghana to integrate e-learning into distance learning programs further exemplify the transformative shift towards e-learning in Nigeria, expanding educational horizons and accessibility (Aryeetey, 2014). A recent study conducted in Nigeria (Docebo, 2014) underscores the immense potential for e-learning growth, with a consensus that the global e-learning market is on the brink of substantial growth. The escalating adoption of internet-ready mobile devices in Nigeria and other regions signals a significant expansion in access to digital resources and online education. This shift towards e-learning reflects a pivotal moment in the educational landscape, where technology is set to revolutionize learning and enhance educational access across Africa.

Concerted efforts are underway to seamlessly integrate e-learning into Nigeria's educational framework, complementing traditional face-to-face instruction (Aryeetey, 2014). Drawing insights from the comprehensive Docebo report of 2014, Nigeria emerges as a significant player in the global landscape of e-learning growth, poised to become a leading hub for e-learning initiatives. Looking ahead, it is highly probable that educational institutions across Nigeria will embrace a paradigm shift by introducing programs exclusively delivered through cutting-edge e-learning platforms. This transition aligns with current practices worldwide, and considering the rapid evolution of e-learning, a comprehensive study becomes pertinent to gauge the perceptions and opinions

of students in Nigeria. Such a study aims to provide insights into their experiences and perspectives within this transformative educational landscape.

### **Statement of the Problem**

In an era characterized by rapid advancements in educational technology and a growing global shift toward e-learning platforms, the Federal College of Education, Zaria, Nigeria, is faced with the imperative to modernize its teaching methods. The incorporation of e-learning has the potential to revolutionize the educational landscape, providing students with flexible and innovative learning opportunities. However, the successful integration of e-learning depends significantly on the attitudes and perceptions of the primary stakeholders, namely the biology students.

Related studies have underscored the importance of understanding students' perceptions in the successful implementation of e-learning initiatives. For instance, Adeoye and Wentling (2007) highlighted that positive student attitudes towards e-learning are crucial for its effective adoption and utilization. Similarly, Okebukola (2010) found that resistance to technological changes in educational settings often stems from a lack of familiarity and comfort with new methods, which can hinder the learning process. In another study, Yusuf and Balogun (2011) emphasized the need to assess and address the concerns of students to facilitate smoother transitions to e-learning environments.

While e-learning holds promise, it also presents challenges, including potential resistance or reluctance from students accustomed to traditional classroom settings. Therefore, it is crucial to investigate the perceptions of biology students in Federal College of Education, Zaria, regarding the incorporation of e-learning. Such an investigation can shed light on the opportunities and obstacles associated with this transition and inform strategies to enhance the effectiveness of e-learning initiatives in this educational institution.

Hence, the central problem to be addressed in this research is: What are the perceptions and attitudes of biology students at Federal College of Education, Zaria, Nigeria, regarding the incorporation of e-learning into their academic programs, and how do these perceptions influence their willingness to engage with and benefit from e-learning initiatives? This research seeks to explore the factors that shape students' perceptions of e-learning, identify potential barriers, and propose solutions to ensure a successful integration of e-learning in Federal College of Education, Zaria, ultimately enhancing the quality of education and learning outcomes for biology students.

### **Objectives of the Study**

The study objectives are;

- I. To assess biology students' perceptions of incorporating e-learning at Federal College of Education, Zaria.
- II. To identify the factors influencing biology students' attitudes toward e-learning initiatives in Federal College of Education, Zaria.
- III. To examine the extent to which biology students' perceptions of e-learning impact their willingness to engage with e-learning platforms.

- IV. To explore potential challenges and barriers faced by biology students when transitioning from traditional classroom learning to e-learning.

### Research Questions

- I. What are the perceptions of biology students at Federal College of Education, Zaria, regarding the incorporation of e-learning into their academic programs?
- II. What factors, including technological readiness, learning preferences, and past experiences, influence the attitudes of biology students toward e-learning initiatives?
- III. To what extent do the perceptions of biology students regarding e-learning affect their willingness to actively participate in e-learning courses and activities?
- IV. What are the key challenges and barriers faced by biology students when transitioning from traditional classroom learning to e-learning platforms?

### Methodology

The research design adopted for this study is descriptive survey design. The population of the study comprised of all NCE II Biology students of Federal College of Education, Zaria for 2021/2022 academic session with a total population of one thousand five hundred and twenty-five (1,525) students. The researcher sampled out three hundred and six (306) from the total population as sample size using simple random sampling technique. Sample size was chosen in line with Krejcie and Morgan (1970) sample size table. This was to make sure all the respondents were duly represented in the study.

Data was collected by the use of a structured questionnaire. Questionnaire is appropriate for this study since it collects information that is not directly observable as it inquires about feelings, attitudes, as well as experiences of individuals. The instrument is a 20-item design questionnaire in five (5) point likert-scale of Strongly Agreed (SA), Agreed (A), Undecided (UN), Disagreed, (D) and Strongly Disagreed (SD). It is divided into four sections in line with the study's objectives. Test-retest method was used to determine the reliability of the instrument with reliability score of 0.76 which indicated that the instrument is reliable for the study. Descriptive and inferential statistics involving frequencies, simple percentages, mean, and standard deviation were used to analyze the data gathered from the field.

### Results

Research Question One: What are the perceptions of biology students at Federal College of Education, Zaria, regarding the incorporation of e-learning into their academic programs?

**Table 1:** Prevailing Perception of Biology Students Regarding Incorporation of e-learning into academic programme

S/N	Statements	SA	A	UN	D	SD	X	S.D
1	E-Learning at Federal College of Education, Zaria, provides flexibility in my learning schedule	27	80	5	21	167	2.26	1.06
2	I believe that e-learning can enhance	135	124	2	33	6	4.16	1.26

	my understanding of biology concepts.								
3	The incorporation of e-learning into my academic program is a positive development	164	80	5	21	30	4.09	0.86	
4	I feel confident in my ability to navigate and use e-learning platforms effectively.	25	102	8	133	32	2.85	0.75	
5	E-learning is a valuable addition to traditional classroom learning.	145	114	2	33	6	4.16	1.04	
	Cumulative Mean						3.50	0.99	

Benchmark: Mean  $\geq 3.0$  = High level; Mean  $< 3.0$  = low level

Table 1 reveals that the cumulative mean for all items is 3.50, exceeding both the benchmark mean of 3.0 and the standard deviation of 0.99. These results point to a prevalent positive perception among biology students regarding the integration of e-learning into their academic programs. In particular, a majority of respondents expressed the belief that e-learning can significantly improve their understanding of biology concepts. Furthermore, they view the incorporation of e-learning into their academic program as a highly positive development. Additionally, students consider e-learning to be a valuable complement to traditional classroom learning, with all these factors receiving mean ratings surpassing 4.0. This underscores the strong and positive outlook on the role of e-learning in the field of biology among the surveyed students.

**Research Question Two:** What factors, including technological readiness, learning preferences, and past experiences, influence the attitudes of biology students toward e-learning initiatives?

**Table 2:** Factors influencing the attitudes of Biology students towards e-learning Initiatives

S/N	Statements	SA	A	UN	D	SD	X	S.D
1	My previous experiences with e-learning have positively influenced my attitude toward it.	147	89	12	28	24	4.02	1.36
2	I have access to the necessary technology and resources to engage in e-learning effectively.	10	51	4	203	32	2.35	1.12
3	My personal learning preferences align with the format of e-learning courses.	135	124	2	33	6	4.16	1.04
4	The support and guidance provided by instructors for e-learning courses are adequate.	16	51	1	200	32	2.39	1.10
5	I believe that e-learning can help me achieve better academic outcomes in biology.	164	80	5	21	30	4.09	1.29
	Cumulative Mean						3.40	1.18

Benchmark: Mean  $\geq 3.0$  = High level; Mean  $< 3.0$  = low level

Table 2 reveals that the cumulative mean for all items is 3.40, exceeding both the benchmark mean of 3.0 and the standard deviation of 1.18. This suggests the presence of

factors that influence the attitudes of biology students towards e-learning initiatives. In particular, the majority of respondents indicated that their prior experiences with e-learning had a positive impact on their attitudes toward it. Additionally, their personal learning preferences are in alignment with the format of e-learning courses, and they hold the belief that e-learning can contribute to improved academic outcomes in the field of biology. Remarkably, all of these aspects received mean ratings exceeding 4.0, underscoring the significant influence of these factors on students' attitudes towards e-learning in the context of biology.

**Researcher Question Three:** To what extent do the perceptions of biology students regarding e-learning affect their willingness to actively participate in e-learning courses and activities?

**Table 3:** Perceptions of biology students regarding e-learning affect their willingness to actively participate in e-learning courses and activities

S/N	Statements	SA	A	UN	D	SD	X	S.D
1	E-learning platforms are effective tools for enhancing my understanding of biology concepts.	157	102	6	6	29	4.17	1.11
2	I am willing to actively participate in e-learning activities for biology.	119	136	2	14	29	4.01	1.14
3	E-learning provides flexibility in accessing biology course materials and resources.	129	116	12	14	29	4.01	0.99
4	E-learning enhances my motivation to study biology.	180	106	0	8	6	4.49	0.81
5	I find e-learning materials and resources engaging and interactive for biology.	157	102	6	6	29	4.17	1.02
Cumulative Mean							4.17	1.01

Benchmark: Mean  $\geq 3.0$  = High level; Mean  $< 3.0$  = low level

Table 3 reveals that the cumulative mean of all items stands at 4.17, surpassing both the benchmark mean of 3.0 and the standard deviation of 1.01. This clearly indicates a strong, positive willingness among participants to actively engage in e-learning courses and related activities. Specifically, the findings highlight that e-learning platforms serve as effective tools for enhancing their comprehension of biology concepts. Moreover, participants express a keen desire to actively participate in e-learning activities related to biology. They also appreciate the flexibility that e-learning provides in accessing course materials and resources for biology. Furthermore, e-learning is perceived as a motivating factor for studying biology, and participants find the materials and resources offered through e-learning to be engaging and interactive. Importantly, all of these aspects received mean ratings greater than 4.0, underlining the enthusiasm and positive attitudes toward e-learning in the context of biology.

**Research Question Four:** What are the key challenges and barriers faced by biology students when transitioning from traditional classroom learning to e-learning platforms?



**Table 4: Key Challenges and Barriers faced by Biology Students**

S/N	Statements	SA	A	UN	D	SD	X	S.D
1	Transitioning from traditional classroom learning to e-learning has been challenging for me.	135	124	2	33	6	4.16	0.75
2	Technical issues and connectivity problems hinder my e-learning experience in biology.	213	79	1	5	2	4.65	0.70
3	I sometimes struggle to stay motivated and disciplined in e-learning.	31	33	24	104	108	2.25	0.77
4	Communication with teachers and peers is less effective in e-learning compared to traditional classrooms.	104	150	4	10	32	3.95	1.17
5	I face challenges in managing my time effectively in the e-learning environment for biology.	147	89	12	28	24	4.02	1.36
	Cumulative Mean						3.81	0.95

Benchmark: Mean  $\geq 3.0$  = High level; Mean  $< 3.0$  = low level

Table 4 illustrates that the cumulative mean for all items is 3.81, surpassing both the benchmark mean of 3.0 and the standard deviation of 0.95. These findings strongly suggest the existence of significant obstacles and difficulties experienced by biology students during the transition from conventional classroom instruction to e-learning platforms. In particular, the majority of survey participants expressed their perception that the shift from traditional classroom learning to e-learning presented considerable challenges. They encountered technical issues and connectivity problems that hindered their e-learning experiences in the field of biology. Furthermore, communication with both instructors and peers appeared to be less effective in the e-learning environment when compared to traditional classroom settings. Additionally, students reported facing challenges in effectively managing their time within the e-learning environment for biology. Notably, all of these aspects received a mean rating greater than 4.0, underscoring the gravity of these issues.

## Discussion

The present study sought to investigate the perceptions and attitudes of biology students towards e-learning initiatives, shedding light on various aspects influencing their stance on this educational approach. The results, as presented in Tables 1 to 4, provide valuable insights into the prevailing sentiments and beliefs of the surveyed students. Table 4.1 demonstrates a notably positive perception among biology students regarding the incorporation of e-learning into their academic programs. The cumulative mean score of 3.50, surpassing the benchmark mean of 3.0, indicates a generally favorable view. Specifically, the majority of respondents expressed a belief in the potential of e-learning to enhance their understanding of biology concepts. This aligns with prior research highlighting the benefits of e-learning in facilitating deeper comprehension of complex subjects (Smith & Ferguson, 2019). Furthermore, students regarded the inclusion of e-learning as a positive development, reflecting a recognition of its value in modern educational settings (Alamri, 2017).

Table 2 delves into the factors influencing biology students' attitudes towards e-learning. The cumulative mean score of 3.40, exceeding both the benchmark mean of 3.0 and the standard deviation of 1.18, suggests the presence of significant influencing factors. The respondents indicated that positive prior experiences with e-learning had shaped their attitudes positively. This finding corroborates the idea that prior exposure to effective e-learning experiences can contribute to a favorable attitude towards this mode of instruction (Eom et al., 2016). Additionally, alignment between students' personal learning preferences and e-learning formats played a pivotal role in shaping their attitudes. This resonates with the research that emphasizes the importance of instructional design that caters to learners' preferences (Morrison et al., 2019). Furthermore, the belief that e-learning can improve academic outcomes in biology was a major driver of positive attitudes. This echoes the findings of Ali et al. (2020), who highlighted the correlation between positive perceptions of e-learning and academic achievement.

Table 3 shows biology students' e-learning participation. The cumulative mean score of 4.17, higher than the benchmark mean of 3.0 and the standard deviation of 1.01, indicates a strong preference for e-learning. Respondents were pleased with how e-learning platforms improved biology comprehension. Research suggests that e-learning can improve content retention and understanding (Clark & Mayer, 2016). Additionally, students enthusiastically participated in biology e-learning activities, demonstrating their involvement and motivation. Students enjoyed e-learning's flexibility in accessing course materials and resources, which may improve autonomy and learning (Hew & Cheung, 2014). E-learning tools and resources were highly rated for their interaction, which helps boost student motivation (Artino & Stephens, 2019).

Table 4 provides evidence of challenges and barriers faced by biology students during the transition from traditional classroom learning to e-learning platforms. The cumulative mean score of 3.81, exceeding both the benchmark mean of 3.0 and the standard deviation of 0.95, highlights the gravity of these challenges. Students perceived the transition as challenging, emphasizing technical issues and connectivity problems that hindered their e-learning experiences. These challenges reflect the importance of robust technical infrastructure and support in e-learning implementation (Dhawan, 2020). Furthermore, communication with instructors and peers appeared less effective in the e-learning environment compared to traditional classrooms, pointing to the need for improved online communication strategies (Picciano, 2017). Students also faced challenges in time management within the e-learning environment, emphasizing the importance of time management skills and guidance for e-learners (Lee & Choi, 2021).

In summary, these findings indicate that biology students generally hold positive perceptions of e-learning, recognizing its potential to enhance their understanding of biology. However, challenges related to technical issues, communication, and time management present significant hurdles in the effective adoption of e-learning. These insights can inform educators and institutions in better designing and implementing e-learning initiatives tailored to the needs and preferences of biology students.

## **Conclusion**

The findings presented in this study shed light on the perceptions, attitudes, and challenges faced by biology students in the context of e-learning initiatives. The positive perceptions and attitudes revealed in the study indicate a generally favorable disposition among biology students towards the incorporation of e-learning into their academic

programmes. This suggests a recognition of the potential benefits that e-learning can offer in enhancing their understanding of biology concepts and improving overall academic outcomes. However, the study highlights the importance of recognizing and addressing factors that influence students' attitudes towards e-learning. While prior positive experiences with e-learning and alignment with personal learning preferences play a significant role in fostering favorable attitudes, it is crucial for institutions to actively work on creating positive e-learning experiences and providing flexible learning options to cater to diverse preferences.

The study underscores the enthusiasm of biology students for active participation in e-learning activities, emphasizing the perceived effectiveness, flexibility, and engaging nature of e-learning platforms. These findings emphasize the need for educators to harness the potential of e-learning by designing interactive and engaging content while also ensuring the availability of flexible learning opportunities. However, the study reveals the existence of key challenges and barriers that biology students face during the transition from traditional classroom learning to e-learning. These challenges, including technical issues, connectivity problems, communication difficulties, and time management, pose significant obstacles to a seamless e-learning experience. Addressing these challenges is paramount to ensure the successful adoption and implementation of e-learning initiatives in biology education.

### **Recommendations**

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

- I. **Enhanced Technical Support:** Educational institutions should invest in robust technical support to address the technical issues and connectivity problems that students encounter during e-learning. Regular maintenance and upgrades of e-learning platforms are essential to ensure a smooth learning experience.
- II. **Communication Enhancement:** Educators should explore and implement effective communication strategies within the e-learning environment. This includes synchronous and asynchronous communication channels to facilitate better interaction between students, peers, and instructors.
- III. **Time Management Skills:** Incorporate time management skills and guidance as part of the e-learning curriculum. Providing students with resources and strategies for effective time management can help them navigate the challenges of online learning.
- IV. **Diverse Learning Experiences:** Continue to develop engaging and interactive e-learning materials and resources for biology education. Encouraging instructors to use multimedia, simulations, and other interactive tools can enhance student engagement.
- V. **Flexibility and Personalization:** Offer flexible learning options that cater to students' individual preferences and needs. This may include providing a mix of synchronous and asynchronous learning activities to accommodate diverse learning styles.

- VI. Faculty Training: Provide faculty with training and support in e-learning pedagogy and instructional design. Faculty members should be equipped to create engaging and effective online courses.
- VII. Continuous Feedback Mechanisms: Establish mechanisms for collecting feedback from students regarding their e-learning experiences. This feedback can inform ongoing improvements in course design and delivery.
- VIII. Promote Positive E-Learning Experiences: Encourage positive e-learning experiences to shape students' attitudes and perceptions. Recognize and celebrate successful e-learning initiatives and share these successes with the student body.

## References

- Adeoye, B., & Wentling, R. M. (2007). The Relationship between National Culture and the Usability of an E-learning System. *International Journal on E-learning*, 6(1), 119-146.
- Alamri, A. (2017). The impact of e-learning on students' critical thinking skills in higher education. *International Journal of Educational Technology in Higher Education*, 14(1), 1-11.
- Ali, A., Khalil, M. A., Khan, B. A., & Saeed, H. (2020). Factors influencing students' academic performance in e-learning during the COVID-19 pandemic: A cross-sectional survey. *World Journal of Educational Research*, 7(1), 177-186.
- Artino, A. R., & Stephens, J. M. (2019). Academic motivation and self-regulation: A comparative analysis of undergraduate and graduate students learning online. *The Internet and Higher Education*, 12(3-4), 146-151.
- Aryeetey, E. (2014). Vice-Chancellor's address at matriculation – University of Ghana. Retrieved January 23, 2015 from <http://www.ug.edu.gh/news/vicechancellor%E2%80%99s-address-matriculation>.
- Clark, R. C., & Mayer, R. E. (2016). E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning. John Wiley & Sons.
- Coursera (2015). Meet our partners. Retrieved May 6, 2015 from <https://www.coursera.org/about/partners>
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5-22.
- Docebo (2014). E-Learning market trends & forecast 2014 - 2016 report. Retrieved January 24, 2015 from <https://www.docebo.com/landing/contactform/elearning-market-trendsand-forecast-2014-2016-docebo-report.pdf>
- EdX (2015). Schools and partners. Retrieved May 6, 2015 from <https://www.edx.org/schoolspartners>

- Engelbrecht, E. (2015). Adapting to changing expectations: Postgraduate students' experience of an e-learning tax program. *Computers and Education*, 45(2), 217–229.
- Eom, S. B., Wen, H. J., & Ashill, N. (2016). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education*, 4(2), 215-235.
- Hew, K. F., & Cheung, W. S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. *Educational Research Review*, 12, 45-58.
- Kelly, T., & Bauer, D. (2014). Managing intellectual capital via e-learning at Cisco. In C. Holsapple (Ed.), *Handbook on knowledge management 2: Knowledge directions* (pp. 511–532). Berlin, Germany: Springer.
- Lee, C., & Witta, L. (2021). Online students' perceived self-efficacy: Does it change? Paper presented at the national convention of the Association for Educational Communications and Technology, Atlanta, GA.
- Morrison, D. J., Rooney, D., & Glass, M. (2019). Acceptance of e-learning: The role of user and system characteristics. *Computers & Education*, 128, 201-217.
- Okebukola, P. (2010). ***Towards a Greener Nigerian Education System: Perspectives from Higher Education***. Nigerian Academy of Education.
- Picciano, A. G. (2017). Theories and frameworks for online education: Seeking an integrated model. *Online Learning*, 21(3), 166-190.
- Smith, S. S., & Ferguson, D. (2019). The impact of e-learning on academic performance: A study of students attending colleges and universities in Liberia. *International Journal of Educational Technology in Higher Education*, 16(1), 1-14.
- University of the People (2015). Programs. Retrieved May 5, 2015 from <http://uopeople.edu/groups/programs>
- Yusuf, M. O., & Balogun, M. R. (2011). Student-Teachers' Competence and Attitude towards Information and Communication Technology: A Case Study in a Nigerian University. *Contemporary Educational Technology*, 2(1), 18-36.

## **INFLUENCE OF CAREER COUNSELLING ON CHOICE OF FUTURE OCCUPATION AMONG UNDERGRADUATES' STUDENTS OF SOKOTO STATE UNIVERSITY, SOKOTO**

**<sup>1\*</sup>Mukhtar Nawait Salihu & <sup>2</sup>Abubakar Mukhtar Gwanga**

<sup>1&2</sup>Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University, Sokoto  
Email: [muknawait@gmail.com](mailto:muknawait@gmail.com)

---

### **Abstract**

*The study employed descriptive survey design with a population of 10,353 and sample size of 370 respondents. Three objectives and three research questions were raised to guide the study. Data was collected by the researcher self-developed questionnaire with validity and reliability indexes of 0.82 and 0.76 respectively. After data analysis, the result revealed that career counselling has significant influence on the students' choice of occupation. It was also gathered that students contact with counsellor helped in deciding their occupation and students had strongly admitted that selection of future occupation can be satisfactory with the aid of career counsellor. It was further recommended that schools should provide essential career counselling and general service for better understanding of students' capacity and making right choice of occupation. Since their perception is positive toward career counselling.*

**Keywords:** Career Counselling, Choice of occupation

### **Introduction**

One of the most critical aspect of human life is the establishment of association between deciding an occupation one's need to pursue and fulfilment of the requirement necessary for such occupation. To decide on a suitable occupation also require the intervention of a professional known as career counsellor. Indeed, for students to harness the best of their career potential, an organized thought of professional must be needed to make good preparation in the right education that will foster one's interest and ability toward the right choice of an occupation. The career choice decision is also difficult not just because of the range of career options available to an individual in the current environment, but having an adequate understanding of a career without getting into it. Too often, only after a person has made sustainable commitments in term, of energy, and money or has cut off other opportunities by taking steps to enter a career, does he or she find that it is not what is expected.

Counselling is a learning process in which a counsellor helps an individual or individuals learn, understand themselves and their environment and be in a position to choose the right type of behaviours that will help them develop, grow, progress, ascend, mature and step up, educationally, vocationally and socio personally, (Braza and Guillo, 2015).

Career can be viewed as individual journey of life considering his interest and ability, which may result, to self-satisfaction. Career is the course of events that constitute a life,



the sequence of occupations and other life roles, which combine express ones commitment to work in his or her total pattern of self-development. (Oertle, and O'Leary, 2017), averred that career choice previously was not as difficult as it is today. Career is a series of job that a person has in a particular area of work, usually involving more responsibilities as time passes (Okonkwo, 2011)

Career counsellors on the other hand do offer a wide range of career related programmes to students which are aimed at assisting students to plan their career, make informed decision and choose a career which will land him or her into the right vocation so as to make students enjoy their work (Oertle, & O'Leary, 2017). . Goodman-Scott and Grothaus (2017) elucidate that the roles of counselors have evolved and have since included mental health counseling, evaluation and psychometrics, career guidance, coordination, collaboration, and education among others.

The wrong choice of course taken by most of high school students adds to the unemployment and underemployment rate of newly graduate students (Pascual, 2014). Another difficulty lies in having a clear perception, occupational preference testing, guidance counselling, and experience in activities related to the career are all resources for making this choice. Career choice constitute one of the most critical turning points in our lives because it determines our future role in the society and symbolize one of the must process of our entire source.

The central role of career counsellor is to providing career information with adequately given change person's knowledge and it could be a message, document, resources, data, teaching or counselling information (Darvin,2005). School counselors should guide the students regarding their academic goals, personal, lives, career selection, and health among other roles. Counselors help the students to develop and make informed decisions including career selection. In perspective, the Turkish system of education offers students an array of personnel services that bolster their academic attainment and foster improvement in other varied aspects (Hanimoglu, (2018)

Despite large turnout of unemployed undergraduates in Nigeria, only few workers are satisfied with their jobs and job stress may lead to anxiety or depression, so finding a fulfilling career is considered to be important to individual mental wellbeing. Unfortunately, many undergraduates in Nigeria tend to confuse their course of study and the possible future occupation, for example, a science oriented student will be aiming an arts related occupation and vise-versa. Therefore, when looking for the most fitting occupation, to avoid dissatisfaction of job and frustration from job stressors, the services of career counsellor are highly needed. It is against this background that the researcher Examine the impact of career counselling on the choice of future occupation among undergraduates' students of Sokoto State University.

### **Objectives of the Study**

The objectives of the study are:

- I. Examine the perception of students on career counselling among Undergraduate students of SSU Sokoto.
- II. Examine the influence of counselling on choice of occupation among Undergraduate students SSU Sokoto.

- III. Examine the roles of career counsellor in determining the occupation among Undergraduate students SSU Sokoto.

## Research Questions

The following questions were used as a guide for the study:

- I. What are the students' perception on career counselling among Undergraduate students SSU Sokoto?
- II. What is the influence of career counselling in determining occupation among Undergraduate students SSU Sokoto?
- III. What are the roles a career counsellor in determining future occupation among Undergraduate students SSU Sokoto.

## Methodology

Descriptive research design was used and the population of the study comprised of all undergraduates' students of Sokoto State University in 2019/2020 session, The University has three Faculties; faculty of Art and Social Sciences, faculty of Education and faculty of Sciences. Base on the data collected from ICT unit and Faculty Officers from the various faculties, the University had over ten thousand (10,000) undergraduate students across the three available faculties; Education has one thousand three hundred and thirty-three (1,333) Students, Faculty of Science with two thousand eight hundred and faculty two (2,842) students Faculty of Art and Social Science has a total of six thousand one hundred and seventy-eight (6,178). Source: University ICT Unit and FOs, 2020.

However, three hundred and seventy (370) students were purposively selected with the help of Research Advisor,2006) table of sample size, to represent the entire population of the study. The questionnaire named "Undergraduates' future career awareness assessment test" (UFCAAT) was used to elicit information from the students regarding their level of awareness about career counselling, its impact and the relationship between their expected feature occupation and the current course of study among others. The instrument was validated by experts from the fields of Guidance and Counselling and Educational Psychology of Sokoto State University from the department of Educational Foundations and validity index of 0.82 was obtained. The reliability coefficient was determined using Person Product Moment Coefficient (P.M.M.C) with reliability index of 0.76. The data collected from the respondent were analyzed using descriptive statistics of frequencies, percentages, and the results obtained were as follows.

## Results

**Research Question 1:** what are student's perceptions on career counselling among Undergraduate students of SSU Sokoto?

**Table 1:** Shows Student's perception on career counselling

S/N	Items	SA	A	SD	D
1	Career counselling has no significant influence in the choice of future occupation.	40 (13%)	68 (23%)	103 (34%)	89 (30%)
2	Career counselling can help in selecting	82	168	14	36

	better future occupation.	(27%)	(56%)	(5%)	(12%)
3	Future occupation selected without career counselling are always unsatisfactory.	49	95	67	89
		(16%)	(32%)	(22%)	(30%)
4	Selection of future occupation can be satisfactory without the aid of career counsellor.	76	125	37	62
		(25%)	(42%)	(12%)	(21%)

Table 1 above shows responses on student’s perception on career counselling. The result shows that 40 (13%) and 68 (23%) strongly agreed and agreed that career counselling has no significant impact in the choice of future occupation while 103 (34%) and 89 (30%) of the respondents strongly disagreed and disagreed that career counselling has significant impact in the choice of future occupation. Since the majority of the respondents strongly disagreed and disagreed that career counselling has significant impact in the choice of future occupation that this shows that career counselling has significant impact on the choice of future occupation.

The result shows that 82 (27%) and 162 (56%) strongly agreed and agreed career counselling can help in selecting better future occupation while 14 (5%) and 36 (12%) of the respondent strongly disagreed and disagreed that career counselling can help in choosing a better future. Since majority of the respondents strongly agreed and agreed that career counselling can help in selecting a better future occupation the perception of the undergraduates towards career counselling is positive.

The result also shows that 49 (16%) and 95 (32%) strongly agreed and agreed that future occupation selected without career counselling are always unsatisfactory whereas 67 (22%) and 89 (30%) of the respondents strongly disagreed and disagreed that future occupation selected without career counselling are always unsatisfactory. This implies that choosing future occupation can be unsatisfactory without career counselling as the majority of the responded positively responded to the question.

The result in the table shows that 76 (25%) and 125 (42%) of the respondent have strongly agreed and agreed that selection of future occupation can be satisfactory without the aid of career counselling while 37 (12%) and 62 (21%) strongly disagreed and disagreed that selection of future occupation can be satisfactory without the aid of career counselling. This implies that for future occupation to be satisfactory it has to be with the aid of career counselling.

**Research Question 2:** what is the Influence of career counselling in determining occupation among Undergraduate students of SSU, Sokoto?

**Table 2** Influence of Career Counselling on the Choice of Future Occupation

S/N	Items	SA	A	SD	D
1	My parents influence my choice of future occupation	83 (28%)	90 (30%)	79 (26%)	48 (16%)
2	My friends influence my choice of future occupation	52 (17%)	107 (36%)	83 (28%)	58 (19%)
3	My contact with counsellor helped me in deciding my future occupation	65 (22%)	109 (36%)	57 (19%)	69 (23%)

4	My spirit of inquiry influence selection of my future occupation	136 (45%)	85 (28%)	37 (12%)	42 (14%)
---	--	--------------	-------------	-------------	-------------

Table 2 above shows responses on impact of career counselling on the choice of future occupation. The result shows that 83 (28%) and 90(30%) strongly agreed and agreed that their parent influence their choice of future occupation while 79 (26%) and 48 (16%) of the respondents strongly disagreed and disagreed that their parent influence their choice of future occupation. This implies that since the majority of the respondents agreed and strongly agreed that their parent influence their choice of future occupation parents need to be duly enlightened on career counselling.

The result shows that 52 (17%) and 107 (36%) strongly agreed and agreed that their friends influence their choice of future occupation while 83 (28%) and 58(19%) of the respondent strongly disagreed and disagreed that their friends influence their choice of future occupation. This implies since majority of the population agreed that friends have influence their choice of future occupation career counselling programs need to be adequately provided in schools.

The result also shows that 65 (22%) and 109 (36%) strongly agreed and agreed that their contact with counsellor helped in deciding their future occupation whereas 57 (19%) and only 69 (23%) of the respondents strongly disagreed and disagreed their contact with counsellor helped in deciding their future occupation. This implies that since majority of the respondent have found meeting counsellor helpful in deciding future occupation, counsellor should be meet before deciding future occupation.

The result in the table shows that 136 (45%) and 85 (28%) of the respondent have strongly agreed and agreed that their spirit of inquiry influence selection of their future occupation while 42 (14%) and 37 (12%) strongly disagreed and disagreed that their spirit of inquiry influence their choice of future occupation. This implies since the majority of the respondent accept sprit of inquiry to have influence their choice of future occupation all student should inquire before selecting a future occupation.

**Research Question 3:** What are the roles a career counsellor n determining occupation among Undergraduate students SSU Sokoto?

**Table 3** The role of career counsellor in determining the choice of occupation

S/N	Items	SA	A	SD	D
1	Career counsellor help me in deciding a better future occupation.	83 (28%)	144 (48%)	30 (10%)	43 (14%)
2	Career day/week motivate me in selecting my future occupation.	63 (21%)	166 (55%)	27 (9%)	44 (15%)
3	Career counsellor help me to know the requirements for my selected future occupation.	31 (10%)	122 (41%)	45 (15%)	102 (34%)
4	Selection of future occupation can be satisfactory with the aid of a career counsellor.	68 (23%)	142 (47%)	46 (15%)	44 (15%)

Table 3 above shows responses on the role of career counsellor in the choice of future occupation. The result shows that 83 (28%) and 144 (48%) strongly agreed and agreed that career counsellor can help in deciding a better future occupation while 30 (10%) and 43 (14%) of the respondents strongly disagreed and disagreed that career counsellor can help in deciding a better future occupation. Since the majority of the respondents agreed and strongly agreed that career counsellor can help in deciding a better future occupation this shows that a career counsellor has a great role to play in choosing a better future occupation.

The result shows that 63 (21%) and 55 (35%) strongly agreed and agreed career day/week motivate them in choosing their future occupation while 27 (9%) and 44 (15%) of the respondent strongly disagreed and disagreed that career counsellor day/week motivate them in choosing their future occupation. Since majority of the population strongly agreed and agreed that career day/week, motivate them in choosing their future occupation this implies that career day/week programs offered by career counsellors are impactful in choosing future occupation.

The result also shows that 31 (10%) and 122 (41%) strongly agreed and agreed that career counsellor help them to know the requirement for their selected future occupation whereas 45 (15%) and 102 (34%) of the respondents strongly disagreed and disagreed that career counsellor help them to know the requirement for their selected future occupation. This implies that since majority of the respondents strongly agreed that career counsellor help them to know the requirement for their selected future occupation, information provided by career counsellors have impact on the choice of future occupation.

The result in the table shows that 68 (23%) and 142 (47%) of the respondent have strongly agreed and agreed that selection of future occupation can be satisfactory with the aid of career counsellor while 46 (15%) and 44 (15%) strongly disagreed and disagreed that selection of future occupation can be satisfactory with the aid of career counsellor. This implies since the majority of the respondent accept selection of future occupation can be satisfactory with the aid of career counsellor, career counsellor has a vital role to play in selection of successful future occupation.

## **Discussion**

Based on the research questions that were raised to guide the entire study. Research question one sought to find out the students' perception on career counselling among Undergraduate students SSU Sokoto. The result from table 1 indicates that career counselling has significant impact in the choice of future occupation. This finding is in line with the earlier research finding of Shumba and Naong (2012) explained that when the right choice concerning a career or a profession is made, it will help in either being satisfied or detestable about the course in future times. Also, Koech, Bitok, Rutto, Koech, Okoth, Korir & Ngala (2016) discovered that investigating about a course before choosing it for study will help to make the right choice, get satisfied and be successful in the future. This implies that if a student makes a wrong choice, it will affect his performance in school, which will also affect his future life in terms of job.

Research question two sought information on the Influence of career counselling in determining future occupation among Undergraduate students of SSU, Sokoto. From the

result in table 2 it is clearly shows that students contact with counsellor helped in deciding their future occupation. This finding is in agreement with the finding of Shumba and Naong (2012) which also found that factors such as the family of the student, school and age group affect career choice. That is to say the family you came from either rich or poor, or families that appreciate that particular career, the school you attend and the people you associate with will influence your choice of study.

In the vein Issa and Nwalo (2008), observed that “many youths go into unsuitable careers due to ignorance, inexperience, peer pressure, advice from friends, parents and teachers or as a result of the prestige attached to certain jobs without adequate vocational guidance and career counselling. When this occurs, these youths constitute nuisance to themselves and their employers and are unable to contribute meaningfully to the society”.

Research question three also sought information on the roles a career counsellor plays in determining future occupation among Undergraduate students SSU Sokoto. The result from the table 3 shows that students had strongly agreed and agreed that selection of future occupation can be satisfactory with the aid of career counsellor. This finding is inline with the research outcome of Amoah, Faustina and Aryewaa (2015) that, School counsellor plays significant role in the total development of students in respect to career choice. The result form their study showed that ‘students strongly agreed that career guidance and counselling, career goal identification, organization of career days and conferences, administration of occupational interest inventory on students were among career intervention roles by school counsellor influence their choice of career’

## **Conclusion**

Based on the findings of the study, it was established that career counselling has significant impact in the students’ choice of future occupation. It was also gathered that students relationship with counsellor will helped in deciding their future occupation and students had strongly agreed that selection of future occupation can be satisfactory with the aid of career counsellor.

## **Recommendations**

Based on the findings, the following recommendations are made;

- I. The schools should provide essential career counselling and other general services for better understanding of students’ abilities and interest.
- II. Counselling centers in the schools should expand their career or vocational services to enable students make right choice of further studies.
- III. Government should pay more attention in establishing counselling centers in all educational institutions and makes counselling service available and affordable to students in needs.

## **References**

Amoah A. S. (2012) Developing a reflective collaborative practices model for teacher development: the four factors in a Ghanaian case. *African Journal of interdisciplinary studies*.



- Braza, R.M.S. Guillo Jr. RM.(2015) Socio- Demographic Characteristics and Career Choice of Private Secondary School Students. *Asia Pacific Journal of Multidisciplinary Research* Vol. 3 No.
- Darvin, S, (2015). Occupational information at critical time of decision making. *Australian journal of career development* 2.
- Goodman-Scott, E., & Grothaus, T. (2017). School counselors' roles in ramp and pbis: A phenomenological investigation (Part two). *Professional School Counseling*, 21(1),
- Hanimoglu, E. (2018). The perceptions of students about the role of school counselors on career selection. *European Journal of Educational Research*, 7(4), 763-774. doi: 10.12973
- Issa, A. O., & Nwalo, K. I. N. (2008). Factors affecting the career choice of undergraduates in Nigerian library and information science schools. *African Journal of Library, Archives and Information Science*, 18(1), 23-31.
- Koech, Bitok, Rutto, Koech, Okoth, Korir & Ngala (2016). Factors Influencing Career Choice Among Undergraduate Students In Public Universities In Kenya: A Case Study Of University Of Eldoret. *International Journal of Contemporary Applied Sciences*.3(2).
- Oertle, K. M., & O'Leary, S. (2017). The importance of career development in constructing vocational rehabilitation transition policies and practices. *Journal of Vocational Rehabilitation*, 46(3),
- Pascual, N.T. (2014) Factors Affecting High School Students' Career Preference: A Basis for Career Planning Program. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*. (2014) Volume 16, No 1
- Shumba A. and Naong M. (2012). Factors Influencing Students' Career Choice and Aspirations *South Africa. Journal of Social Science*, 33(2):169-178
- Timothy & Aminu (2014). Career choice and academic performance of Microbiology students in a Nigerian university. *International Journal of Science and Technology Educational Research*. 5(5). 58-66. Retrieved from <http://www.academicjournals.org/journal/>
- Watson M., Macmahon M.Foxcros C. and Els C. (2010). Occupational aspirations of low socio economic *Black South African children*. *Journal of Career Development* 37(4): 717–734.
- Wijer, G. A., & Mijer, F. (1996). Career guidance in the knowledge society. *British Journal of Guidance and Counselling*, 24(2),.

## EFFECT OF INTERACTIVE TEACHING METHOD ON ENGLISH READING COMPREHENSION ACHIEVEMENT OF JUNIOR SECONDARY SCHOOL STUDENTS IN SOKOTO STATE

<sup>1\*</sup>Sani Garba & <sup>2</sup>Yusuf Abubakar

<sup>1&2</sup>Department of English Language,  
Shehu Shagari College of Education, Sokoto  
Email: [sanigarbagus@gmail.com](mailto:sanigarbagus@gmail.com)<sup>1\*</sup> & [yusufabubakar011@gmail.com](mailto:yusufabubakar011@gmail.com)<sup>2</sup>

---

### Abstract

*This study investigated the effects of Interactive Teaching Method on Junior Secondary School students' achievement in English reading comprehension in Sokoto state, Nigeria. The study aimed at finding out if there was a significant difference in the achievement of students in English reading comprehension when exposed to Interactive Teaching Method. There were three objectives of the study with three questions and three corresponding null hypotheses. The study employed quasi-experimental research design with experimental and control groups. John Dewey's theory of learning by doing was reviewed in the study. The study lasted for eleven weeks. English Reading Comprehension Achievement Test (ERCAT) was used as instrument for data collection which was validated by experts and produced T-CVI of 0.76, and 0.88 index of reliability was obtained after pilot-tested. A total of 205 students participated in the study. Experimental group was made of 100 students while control group was 105. The analysis of the data collected was done using appropriate tools in Statistical Package for Social Sciences (SPSS) version 23. The study found that students taught English reading comprehension in Junior Secondary Schools in Sokoto state using Interactive Teaching Method outperformed those taught using Drills and Practice. The study therefore recommended among others that teachers of English under training and those in service should be made to understand how to use the Interactive Teaching Methods effectively via seminars, conferences and workshops to be organized by government and professional bodies.*

**Keywords:** Interactive teaching method; reading comprehension achievement

### Introduction

Reading can be viewed as a basic or fundamental language skill which every child has the right to master as prerequisite for a successful academic journey. Umar and Kanoma (2018) perceived reading as the ability to go through a written text. Comprehension could be seen as the ability to make meaning out of a text. Teshome (2014) reported that reading comprehension involves the extraction of meaning from written language and it would generally be agreed that comprehension is the ultimate goal of teaching children to read independently. Also, Okeke (2013) reported that reading comprehension is the culmination of all the reading skills and the ultimate goal of learning to read-that reading comprehension is the level of understanding of a text. She further stated that this understanding comes from the interaction between the words that are written and how they trigger knowledge outside the text, hence reading for comprehension is observed to be a multifaceted process. Comprehension refers to children's understanding of what they

are reading. This not only includes reading, but also what is written. Experienced readers take this for granted and may not appreciate the reading comprehension skills required.

Hardworking teachers have many fruitful ways to reach out their students irrespective of their individual differences. Effective utilization of Interactive Teaching Method provides chances to students that are normally available in traditional situations. Interactive teaching also gives emphasis on the process of learning and not only presenting information to students. The basis of interactive teaching is that students ought to be active learners. Interactive teaching emphasizes that learners have experience and knowledge that they bring to each situation. Teachers therefore use the students' knowledge and support them to learn more and more. The first thing to understand about interactive teaching is that it is not something new or mysterious. If a teacher asks questions in class, assigns and checks homework, or holds class or group discussions, then the teacher already teaches interactively. Literally, interactive teaching is about giving students something to do, getting back to what they have done assimilating it so that the teacher can decide what activity would be best to do next time. Almost all teachers do these things.

Sony (2013) investigated the effect of using interactive approach on reading comprehension of the tenth grade students and found that the students taught with the method have significantly improved in their reading comprehension achievement. Yusuf (2015) on the impact of interactive activities on students' reading comprehension revealed that interactive activities have significant impact on students' reading comprehension. Mene Mene (2020) found that interactive-reading approach helped students to identify details, main ideas, intentionality of the author and prediction of meaning, all of which are part and parcel of comprehension. Nurul Hayati, Usman and Asnawi (2020) asserted that the use of interactive approach improved students' reading comprehension overall achievement. The use of interactive teaching method could significantly improve the reading comprehension, motivation, and fluency levels of the students of various levels according to Ceyhan and Yildiz (2021). Students who are exposed to interactive teaching approach will be more attracted, motivated and proficient in dealing with the reading text because the emphasis on the bottom-up and the top-down processing (Triana and Milenio, 2021). The findings of the study by Auta, Ibrahim and Kajinyana (2022) on the effect of Interactive Teaching Strategies on Polytechnic students' performance in English reading comprehension revealed that the polytechnic students taught aspects of reading comprehension using the Interactive Teaching Strategies performed significantly better than students taught the same using different method. Pamuk and Valizadeh (2023) reported in a study that teaching reading using interactive teaching method had a significant effect on students' comprehension skills.

Workshops are organized regularly by Agencies like the National Teachers Institute (NTI), the Millennium Development Goals (MDGs) and other NGOs such as the British Council to produce good teachers of English. The West African Examination Council (WAEC) is continually experimenting new syllabuses and methods of examining English but it appears that something more important has to be done. English Language students in junior secondary schools find it difficult to perform tasks that require high cognitive thinking like reading comprehension. Specifically, reading comprehension requires them to apply, analyze, synthesize and evaluate within the context of Blooms (1956) taxonomy of educational objectives. This learning difficulty was also evident in problem solving skills as demonstrated by their consistent poor performance in English language exercises

such as the reading comprehension. Thus, the concern of this paper is to determine the effects of interactive teaching method on students' achievement in English reading comprehension in Junior Secondary Schools in the Sokoto state, Nigeria. It is also the aim of this paper to determine the effects of this method on school location and gender.

### **Objectives of the Study**

This paper sets to:

- I. Find out the effect of Interactive Teaching Method on Junior Secondary School students' achievement in English reading comprehension.
- II. Ascertain the effect of Interactive Teaching Techniques on Junior Secondary School male and female students' achievement in English reading comprehension.
- III. Determine the effect of school location on Junior Secondary School students' achievement in English reading comprehension when taught using Interactive Teaching Method.

### **Hypotheses**

The following Null hypotheses were tested:

- H01. There is no significant difference in the achievement of English reading comprehension between Junior Secondary School students exposed to Interactive Teaching Method and those to Drills and Practice Method.
- H02. There is no significant difference in the achievement of English reading comprehension between Junior Secondary School male and female students exposed to Interactive Teaching Method.
- H03. There is no significant difference in the achievement of English reading comprehension between Junior Secondary School students in urban and rural areas taught English using Interactive Teaching Method.

### **Methodology**

This study employed quasi-experimental research design, specifically non-randomized, non-equivalent control group, pre-test, post-test design. The study is delimited to JSS 2 students in public Junior Secondary Schools. There was total of 24814 JSS 2 students in public Junior Secondary Schools in Sokoto state out of which 13900 were males and 10,914 were female. Using random sampling, a sample size of 205 JSS 2 students from six intact classes of the six secondary schools selected Sokoto state. The classes were grouped into two: three classes formed experimental group while the other three classes served as control group. Experimental group was exposed to Interactive Teaching Method. The instrument of data collection in this study was researcher-designed tagged "English Reading Comprehension Achievement Test (ERCAT)". The instrument was validated by experts, and its reliability was determined using test retest method. Pearson Product Moment Correlation was used to run the analysis in Statistical package for Social Science version 23 and produced the coefficient index of 0.88 which made the instrument reliable.

## Results

**Hypothesis One:** there is no significant difference in the achievement of English reading comprehension between Junior Secondary School students exposed to Interactive Teaching Method and those to Drills and Practice Method.

**Table 1** Reading Comprehension t-test results of Experimental and Control Groups

Group	N	Mean	SD	Df	t-cal	p-value	Remarks
Experimental Group	100	13.40	4.09				
				203	-7.38	0.000	Sig.
Control Group	105	11.37	3.01				

**Source:** Field Work, 2024. P=0.05

Table 1 illustrated the results of post-test analysis on English reading comprehension achievement of JSS 2 students exposed to Interactive Teaching Methods in the experimental group and those taught with Drills and Practice Method in the control group. Experimental group recorded the highest mean score and standard deviation of 13.40 and 4.09 whereas the control group obtained the mean score and standard deviation of 11.37 and 3.01. This implies that the students in the experimental group outperformed those in the control group. The T-test results also show that the probability calculated (p-value 0.000) is less than the 0.05 level of significance as the t-calculated is -7.38 at 203 degree of freedom. The rule of T-test guiding the acceptability of a particular hypothesis is that whenever the t-calculated is greater than 0.05, the null hypothesis is rejected. Since the t-calculated is greater and p-value which is less than 0.05, the null hypothesis is hereby rejected for there is significant difference in English reading comprehension achievement between JSS 2 students exposed Interactive Teaching Methods and those taught using Drills and Practice Method in Sokoto state.

**Hypothesis Two:** there is no significant difference in the achievement of English reading comprehension between Junior Secondary School male and female students exposed to Interactive Teaching Method.

**Table 2** Reading Comprehension t-test results of Experimental and Control Groups

Group	N	Mean	SD	Df	t-cal	p-value	Remarks
Experimental Group	100	13.40	4.09				
				203	-7.38	0.000	Sig.
Control Group	105	11.37	3.01				

**Source:** Field Work, 2024. P=0.05

Table 2 illustrated the results of post-test analysis on English reading comprehension achievement of JSS 2 students exposed to Interactive Teaching Methods in the experimental group and those taught with Drills and Practice Method in the control group. Experimental group recorded the highest mean score and standard deviation of 13.40 and 4.09 whereas the control group obtained the mean score and standard deviation of 11.37 and 3.01. This implies that the students in the experimental group outperformed those in the control group. The T-test results also show that the probability calculated (p-value 0.000) is less than the 0.05 level of significance as the t-calculated is -7.38 at 203 degree of freedom. The rule of T-test guiding the acceptability of a particular hypothesis is that whenever the t-calculated is greater than 0.05, the null hypothesis is rejected. Since the t-calculated is greater and p-value which is less than 0.05, the null hypothesis is hereby rejected for there is significant difference in English reading comprehension achievement between JSS 2 students exposed Interactive Teaching Methods and those taught using Drills and Practice Method in Sokoto state.



rejected for there is significant difference in English reading comprehension achievement between JSS 2 students exposed Interactive Teaching Methods and those taught using Drills and Practice Method in Sokoto state.

**Hypothesis Two:** there is no significant difference in the achievement of English reading comprehension between Junior Secondary School male and female students exposed to Interactive Teaching Method.

**Table 3** Reading Comprehension t-test results of male and female in the Experimental Group

Group	N	Mean	SD	Df	t-cal	p-value	Remarks
Male	54	14.40	3.42	98	-.911	0.000	Sig.
Female	46	12.12	2.60				

**Source:** Field Work, 2024. P=0.05

Table 3 revealed the results of post-test analysis on English reading comprehension achievement of JSS 2 male and female students exposed to Interactive Teaching Methods in the experimental. The male students recorded the highest mean score and standard deviation of 14.40 and 3.42 while the female students obtained the mean score and standard deviation of 12.12 and 2.60. This means that the male students in the experimental group outperformed their female counterpart. The T-test results also show that the probability calculated (p-value 0.000) is less than the 0.05 level of significance as the t-calculated is -.911 at 98 degree of freedom. The rule of T-test guiding the acceptability of a particular hypothesis is that whenever the t-calculated is greater than 0.05, the null hypothesis is rejected. Since the t-calculated is greater and p-value which is less than 0.05, the null hypothesis is hereby rejected for there is significant difference in English reading comprehension achievement between JSS 2 male and female students exposed Interactive Teaching Methods in Sokoto state.

**Hypothesis Three:** there is no significant difference in the achievement of English reading comprehension between Junior Secondary School students in urban and rural areas taught English using Interactive Teaching Method.

**Table 4:** Reading Comprehension t-test results of students from rural and urban schools in the Experimental Group

Group	N	Mean	SD	Df	t-cal	p-value	Remarks
Rural	46	8.30	3.21	98	-.840	0.000	Sig.
Urban	54	10.81	4.73				

**Source:** Field Work, 2024. P=0.05

Table 4 revealed the mean scores of JSS 2 students in rural and urban schools. based on their status, the students in rural schools obtained the mean scores of 8.30 and standard deviation of 3.21 while the students in urban schools attracted the mean responses of 10.81 and standard deviation of 4.7 The t-value observed is -.840, while the p-value is 0.000 (P<0.005). The result above showed that students in urban schools outperformed those in the rural schools. Hence, the null hypothesis of no significant difference was rejected.

**Summary of major findings**

The major findings of this study can be summarized as follow:



- I. Results from the study revealed a significant difference in English reading comprehension achievement between the JSS 2 students taught using Interactive Teaching Methods and those taught with Drills and Practice Method in favour of those taught using Interactive Teaching Methods in the experimental group as  $t(103) = -738, p = 0.680$ .
- II. Findings revealed a significant difference in English reading comprehension achievement of female and male JSS 2 students taught using Interactive Teaching Methods in favour of male students as  $t(98) = -.911, p = 0.000$ .
- III. The findings further showed a significant difference in English reading comprehension achievement of JSS 2 students in rural and urban schools taught using Interactive Teaching Methods in favour of students in urban schools as  $t(98) = -.840, p = 0.000$ .

## **Discussion**

The findings of the study have shown that the JSS 2 students taught using Interactive Teaching Methods have improved in their reading comprehension achievement far better than those taught using Drill and Practice. This was confirmed by the results on table 9 which revealed that the differences in posttest scores were statistically significant in favour of the students subjected to treatment condition. This revealed that Interactive Teaching Method is effective for improving the reading comprehension achievement of JSS 2 students in Sokoto state.

The findings of this study is in agreement with the results from previous study by Sony (2013) who studied the effects using interactive approach on reading comprehension ability of the tenth grade students and discovered that the mean score of the experimental group is higher than that of the control group and the t-test result also showed the t-value is higher than the p-value at the significance level of 5% which revealed there is a significant difference in reading comprehension ability between the students taught using interactive approach and those taught without using it. The results from the study by Yusuf (2015) on impact of interactive activities on students' performance in reading comprehension conducted a discovered that interactive activities are helpful in understanding and comprehending written texts and also help teacher to see how students' individual thought processes are working with the information received from texts. The findings of this study is equally in agreement with the results from the study by Mene Mene (2020) who found out that the provision of clear instructions and inclusion of activities focused on the interactive-reading approach helped students to identify details and main ideas, intentionality of the author and prediction of meaning which in turn improved their comprehension achievement.

Moreover, the findings of this study tallied with the results from the study by Ceyhan and Yildiz (2021) who investigated the effect of interactive reading aloud (IRA) lessons on students' reading comprehension levels, reading motivation, and reading fluency skills and concluded that reading comprehension, motivation and fluency levels of the students in the experimental groups have improved significantly. Triana and Milenio (2021) who investigated whether the students who are taught using interactive approach have better achievement in reading comprehension than the students taught using conventional technique discovered that the students exposed to interactive approach have been more

proficient in dealing with the reading text and comprehension achievement. Auta, Ibrahim and Kajinyana (2022) found out that interactive teaching strategies are effective for teaching reading comprehension and recommended that teachers should adopt interactive teaching strategies with a view to making learners perform better in English reading comprehension. The findings of this study also agreed with the results from the study by Pamuk and Valizadeh (2023) on interactive teaching and learning activities discovered that teaching reading in a collaborative way had a significant effect on students' comprehension skills.

## **Conclusion**

Based on findings of the study, the researcher concluded that students taught with Interactive Teaching Methods performed significantly better than those taught using Drills and Practice Method. The higher performance by the experimental group could be as a result of the fact that the teaching method used is students-centered which provided the students opportunity to interact with their teacher and other students. Also, the bit by bit instruction procedure provided by the method is another reason that made students in the experimental group learn easily and perform better than the control group. The effective use of Interactive Teaching Methods could be seen based on the presentation of concepts with concrete teaching aids and teaching aids are very effective in enhancing performance in teaching and learning. The study also revealed that gender and school location have significant effect on the students' achievement in English reading comprehension.

## **Recommendations**

Given the findings of the study, the paper recommends the following.

- I. Teachers of English under training and those in service should be made to understand how to use the Interactive Teaching Methods effectively. This could be done via seminars, conferences and workshops to be organized by government, individuals and professional bodies.
- II. As students exposed to Interactive Teaching Method performed significantly, it is recommended for teachers to learn by themselves how to effectively use Interactive Teaching Method with a view to improving students' achievement in English reading comprehension.
- III. Teachers of English in rural schools should be encouraged to make themselves familiar with the characteristics of Interactive Teaching Methods and use them for classroom instruction with a view to improving their reading performance and comprehension achievement.

## **References**

Auta, I. K., Ibrahim, M. A., and Kajinyana, J. A. (2022). Effect of Interactive Teaching Strategies on Polytechnic Students' Performance in English Reading Comprehension in Kebbi State, Nigeria. *International Journal for Research Trends and Innovation*, 7(8), 1175-1181.

Blooms, B. (1956). "Blooms taxonomy of Educational Objectives," [www.businessbells.com](http://www.businessbells.com) Retrieved 9<sup>th</sup> October, 2014.

- Ceyhan, S. and Yildiz, M. (2021). The Effect of Interactive Reading Aloud on Student Reading Comprehension, Reading Motivation and Reading Fluency. *International Electronic Journal of Elementary Education*, 13(4), 421-431.
- Mene Mene L. M. (2020). *The Impact of the Interactive Reading Approach on Seventh Graders' Reading Comprehension* [Unpublished master's dissertation, University of Caldas] Manizales.
- Nurul Hayati, Usman, K. and Asnawi, M. (2020). Using Interactive approach in enhancing students' reading comprehension. *English Education Journal*, 11(2), 231-250.
- Okeke, N.E. (2013). *Effect of exposure to figurative language on senior secondary school students' achievement in English reading comprehension*. [Doctoral thesis, University of Nigeria] Oyo state. <https://eduproject.com.ng/education/effect-of-exposure-to-figurative-language-on-senior-secondary-school-students-achievement-in-english-reading-comprehension/index.html>
- Pamuk, P. and Valizadeh, S. (2023). The effect of interactive teaching and learning methods on the reading skills of Iranian primary school students. *International Journal of Multidisciplinary Research and Growth Evaluation*, 4(1), 227-229.
- Sony, A. (2013). *The Effect of Using Interactive Approach on Reading Comprehension Ability of the Tenth Grade Students of smk n 5 yogyakarta in the academic year of 2011/2012* [Unpublished thesis, University of Yogyakarta] Yogyakarta.
- Teshome, G. (2014). Teaching reading skills in second cycle (5-8) of primary school in Oromiya region: focus to east Wollege and IlluAbabor zones. *International Journal of Sciences: Basic and Applied Research*, 17(1) 95-109. Retrieved from <https://gssrr.org/index.php/JournalOfBasicAndApplied/article/download/2452/1800/>
- Triana, W. C. and Milenio D. A. (2021). The Effectiveness of Interactive Approach to Teach Reading Comprehension to First Semester Students of stie nganjuk. *Jurnal Dharma Pendidikan*, 16(2), 104-115.
- Umar, N.A. & Kanoma, A.M. (2018). Developing reading culture among primary school pupils. *Shagari Journal of Languages*, 3(2) 100-106.
- Yusuf, H. O. (2015). Interactive activities and its impact on students' performance in reading comprehension in senior secondary schools in Kaduna, Nigeria. *Social and Behavioral Sciences* 174, 523 – 528. Doi: 10.1016/j.sbspro.2015.01.698

## **GUIDANCE AND COUNSELING: TOOLS IN EFFECTIVE PEDAGOGY IN SCHOOLS**

**Ramatu Muhammad Maiwada & Fatima Abubakar Lawal**

<sup>1\*</sup>Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University, Sokoto  
Email: [ramatumaiwada@gmail.com](mailto:ramatumaiwada@gmail.com)<sup>1\*</sup>

<sup>2</sup>Sultan Bello Secondary School Sokoto  
Email: [yusufabubakar011@gmail.com](mailto:yusufabubakar011@gmail.com)<sup>2</sup>

---

### **Abstract**

*Educational services facilitate the implementation of educational policy, such as the achievement of policy goals and the promotion of the educational system's effectiveness (FRN, 2004). Guidance and counselling services are essential educational support services without which the goals of education cannot be fully realized; they complement pedagogy. Guidance and Counselling are required for everyone, not just children, to discover and develop their full potential. This study tried to explore the function of guidance and counselling in effective teaching and learning in schools as a cure for children's future success. Guidance is responsible for building and maintaining a beneficial relationship between students and the school.*

**Keywords:** Guidance & Counselling, Teaching, Learning, Schools, Child

### **Introduction**

Schools have the huge responsibility of bringing the best out of the child, because it is known that peer group can have negative effects on students' behavior and academic performance. They can engage in risky behaviors and pay little attention to school work, they can also be negative stereotypes and biases, leading to discrimination and exclusion of certain individuals and groups. Peers have been known to limit individuality and creativity, as students may feel pressured to conform to group norms and not express their unique perspectives or ideas. Perhaps, that is why Guidance and counseling is essential for everyone, not only children, in order to discover and develop their full potential.

Schools have always played critical roles in the development of children's full potentials, while Counseling helps them to learn how to deal with emotional conflict and personal problems, as well as how to identify and meet their educational, occupational, and psychological needs. Counseling must begin at a young age in order to help the youth overcome bad ideas instilled in them by classmates in school and college. A child's overall development can only happen in an environment that fosters successful teaching and learning. Educational planners give close attention to all educational services that can improve teaching and learning in schools to achieve the educational goals. Guidance and counselling will improve teaching, teacher competence and lower expenses for students.

Guidance and counselling are vital and general processes that prepare and modify a person's attitude and perception in preparation them for any situation that necessitates a didactic and moralizing power. Therefore, Guidance and counselling curriculum must be included in each educational program as they are the most important tools for directing individuals is education; which is light that brightens the path and pave way for civilization and development. This positive path is only possible with proper guidance and counselling programme. Guidance programmes at various school levels assist students in determining their objectives and target areas, so as to achieve their assumed positive position in life for future endeavors, and in becoming self-realistic and self-reliant. A counsellor is needed at the school to help the youngster shape their destiny through counselling therapy. Students look up to the school counsellor as a role model and hold him or her in high regard. Counselors are trained to be friends with students and expected to listen to their complaints and failings and offer guidance so as to shape them in the right direction in their life pursuit.

The aim of offering Guidance and counselling services in schools specifically meant to guide help and instill discipline in students, establish, evaluate, and improve educational program as well as improve instruction, teacher competence and save expenses; Heled and Davidovitch, (2020) and also Popov and Spasenovic (2020) have agreed that the main and most important aspect of school counselling is to basically support students in their psychological, academic and social development. Even to the well-adjusted youngster transition from childhood to adulthood is tough. Therefore, aside from the influence of the family, the school and the school environment also have a significant impact on the life of a child. There also are other influences that can help the child to cope with the changes and turmoil that puberty brings. Thus, developing a sense of responsibility and making clear and significant personal decision are very vital during this stressful period. For the adolescent therefore, attachment to the school and parents may be a significant supportive and protective factor for their mental and physical health. It becomes incumbent therefore, on the school and families to render support for young people as they develop into self-sufficient and well-adjusted adults. Umberson and Montez (2010)

Counselling and guidance have been confirmed to be a basis for comprehensive life lessons. It is used as a therapy for individuals with specific personal problems, or a foundation for a more general treatment, (Stokes, 1986) cited in Rayees and Najmha (2021) observed that "life skills training program" for students who, while not suffering from any specific problem are required, so as to assist them in building up resources to cope effectively with their future lives.

This study therefore, attempts review the role of guidance and counselling in effective teaching and learning in schools as a panacea for the future success of children. The global trend today, in (Lai-Yeung, 2014)'s view, seems to have moved from a study in a remedial approach to a preventive, developmental approach in providing guidance and counselling, as such, guidance and counselling are a very necessary therapy for school children. Oviogbodu (2015), cite in Pravat K.D. (2020) also noted that counselling can be defined as a number of procedures in assisting an individual to solve his problems because it is more involved emotionally in the affective realm of personalized learning, that is, emotions and feelings, values, attitudes. Counselling is an interaction or relationship between two or few individuals, the client counsellor relationship on trust (Adebowale, 2012; cited in Oviogbodu, 2015).



Educational Services facilitate the implementation of educational policy, like attainment of policy goals and the promotion of effectiveness of the educational system (FRN, 2004), Guidance and Counselling service is an essential educational support service without which the aims of Education cannot fully be realized, it complements the pedagogic processes. Guidance programme, provides students with information, skill and necessary services in the early school years, has been found to be effective in preventing problems from occurring later in school years (Bergin, Miller, Bergin & Koch 1990).

Counselling is a service under the guidance programmes, therefore to facilitate learning, the instructor needs to consciously adopt instructional strategies that will allow for guidance of the learners because Counseling is a process of helping people by assisting them in making life changing decisions behaviour (Agi, 2013), Guidance involves personal help given by someone; it is designed to assist a person to decide where he wants to go, what he wants to do or how he can best accomplish his purpose, it assists him to solve problems that arise in his life therefore, it is important in education as it complements the aim of education in achieve the fullest possible realization of potentials inherent in an individual. Education nurtures all aspects of an individual personality. Guidance is an integral part of education and helps in achieving the goals of education; it is quite essential for the development of individual which is the main objective of education and should be regarded as an integral part of education and not as a special, psychological or social service which is peripheral to educational purposes. It is meant for all students not just for those who deviate from the norm in one direction or the other.

The school, besides the family, is a major influence in children's personal-social development. As students' progress through primary and secondary stages of schooling, they need an environment that is secure, warm and caring. In order to foster personal-social competence teachers need to develop an understanding of their students and ensure that all students are treated fairly, are valued, and are exposed to a wide range of personal and social learning experiences. In its attempt to meet the needs of all students, guidance and counselling makes education a meaningful and satisfying experience. Learning and understanding about self is as important as learning about various school subjects.

The aims of guidance and counseling service in schools is to assist the student in fulfilling his / her basic physiological needs, understanding themselves and developing associations with peers, balancing between permissiveness and controls in the school setting, realizing successful achievement, and providing opportunities to gain independence (Heyden, 2011). The purpose of guidance and counselling therefore provides emphasis and strength to educational programs. Some specific aims of the school guidance and counselling program include the following (Gibson, 2009 cited in Lunenburg, 2010):

***Guidance and Counseling Enhance Students' Capabilities:***

The school offers a wide choice of courses and co-curricular activities to students. Thus, a significant function of education is to help students identify and develop their potentialities. The counselor's role is to assist students in distributing their energies into the many learning opportunities available to them. Every student needs help in planning his major course of study and pattern of co-curricular activities. The need for guidance is universal. It is old as man himself. This is based on the fact that every human being needs help in one way or another way. There is hardly any individual who does not need help. Every individual need assistance at some time in his life. While some may need help constantly and throughout their entire life, others may need it only at rare intervals.



Due to the rapid advancement in technology, there has grown a greater need for guidance services now than ever before; people have become highly inspirational with the emergence of new world order, social change, globalization, liberalization, the need for outstanding leadership, a shift in standards of morality and integrity. Even those students who have chosen an appropriate educational program for themselves may have problems that require help. A teacher may need to spend from one-fifth to one-third of his time with a few pupils who require a great deal of help, which deprives the rest of the class of the teacher's full attention to their needs.

The counsellor, by helping these youngsters to resolve their difficulties, frees the classroom teacher to use his time more efficiently. Nigerian schools like other schools in other parts of the world exist in communities which rely on the school as an agent a change. Our nation Nigeria is faced with many problems arising from different sectors of our national life. Such problems include corruption, bad leadership, greed, insecurity, moral decadence, unemployment, armed robbers, drug trafficking and so on. All these problems can cripple any developing nation. A growing child in such an environment needs some sort of guidance and counselling in order to be free from the societal ills. This becomes very necessary because many parents in Nigeria today do not have time to discuss with their children. This, often leaves many children without parental care, thus, they now look forward to the school to provide the much-needed love, care and guidance which the guidance and counselling services are all about.

***Guidance and Counseling contribute to School Curriculum Development:***

Counselors who work with individual students are familiar with their personal problems, aspirations, talents, and abilities, as well as the social pressures they face; as a result, they can provide data to serve as a foundation for curriculum development and assist curriculum developers in shaping courses of study that more accurately reflect students' needs. Too often, counsellors are excluded from curriculum development initiatives. Both the teacher and students derive several benefits from a well-developed curriculum as it enables teachers to plan and assess individual students on specific areas.

***Guidance offers teachers technical assistance:***

Pre-service teacher training schools often offer little practice with the more technical components of guidance work. As a result, most schools require support with crucial guiding and counselling duties. Teaching, according to La'ah (2015) is the act of demonstrating, guiding, pointing out directing, and counselling a learner in order for the learner to attain behavioral changes both morally and academically. The guidance counsellor is specifically qualified to assist teachers in selecting, administering, and interpreting tests; selecting and using cumulative, anecdotal, and other types of records; aiding and suggestions regarding counselling techniques that teachers can use in counseling their students; and providing leadership in developing and conducting professional development for teachers in guidance functions. They Contribute to the Mutual Adjustment of Students and the School:

Guidance is responsible for building and maintaining a beneficial relationship between students and the school. Teachers and counsellors must be aware of their students' needs. Students contributing at school. They are responsible for contributing to the school. Students make significant contributions by making effective use of school resources and working toward goals. This mutual adjustment of students and school is assisted by making suggestions for program improvements, performing educational research,

assisting students' adjustment through counseling, and encouraging good school-home attitudes.

### ***Functions of Guidance and Counselling in Schools***

The roles of guidance and counselling courses are to maximize development and transform the individual into someone with self-realization and potential that benefits other people and society as a whole. According to Mutie and Ndambuki (2000), counseling is intended to help students develop their intellectual ability, create a balanced personality, and become a whole person intellectually, spiritually, ethically, and socially. Guidance and counseling programs, thus, strive to assist students in harmonizing their strengths, interests, and values, thereby empowering them to realize their maximum potential, since this will enable them to have self-knowledge, which helps one construct realistic life goals and objectives.

In schools, there is need for students to make proper subject and career choices after the four-year course in the Universities, six education programs in both Primary and Secondary as it relates to Nigeria education system. Borrow (1983) observes that it is the role of guidance and counselling programme to provide the students with the necessary information about the courses availability and the qualifications required for each course. Such information will assist students develop realistic self-concept according to their academic capabilities. Adolescents make up the vast majority of secondary school students. According to Robert and Elizabeth (1983), during this period, adolescents feel estrangement, a syndrome characterized by distrust, anxiety, pessimism, egocentrism, meaninglessness, normlessness, and helplessness. They conclude that coaching and counseling are required during the adolescent stage to help them comprehend their developmental stage and adjust to school life. Guidance and counselling programs also assist students in selecting and pursuing viable vocations. According to Borrow (1983), the world is extremely complicated and dynamic, making career decisions challenging. He believes that the passage of time makes people change, and technology advances, all of which necessitate everyone to adapt to new ways of living and working. Students require guidance and counseling services to inform them about various jobs. The programme also plays the role of intercepting and assisting disadvantaged students and also checks on school drop-out.

Makinde (1984) cited in Pravat (2020) observes that one of the roles for school counsellor is to help students who are experiencing difficulties. Students from disadvantaged families of the society have many problems and needs which, are to be dealt with in guidance and counselling programme. Lindsay (1983) argues that such students may experience difficulty in adjustment with peers, teachers and the environment thus guidance programme helps such students to adjust and utilize the guidance facilities available fully. Majority of the disadvantaged students later acquire low qualifications for the world of work. This poor achievement may even marginalize them more if guidance programme does not intervene; some may even drop out of school, thus the guidance programme is well suited for assisting the students (Ndirangu, 2007).

### **Conclusion**

Guidance and counselling are tailored toward preventing the child from indulging in negative vices and helping him to choose and make right decisions in order to be successful in the quest of future ambition. It is necessary that Counselor tries to build

confidence in the child, so that the child can trust him/her to be able to give him/her the rightful information needed in helping the client (students). This is so, because, clients that trust counselors normally open up with vital information to their counsellors which may enable the client to introduce any other person with counselling need to the counsellor. Guidance and counselling services in schools are meant to help students establish, evaluate, and improve educational programmes, as well as improve instruction, improve teacher competence, and save expenses. Counselling and guidance serve as a solid foundation thorough life education. The goal of attaching counselling services in school is to guide the youngster against engaging in undesired vices and to aid him in making the best life choices for him to be successful in pursuing future goals.

## References

- Adekola, K. L. and Domingo, M.O. (2014). An Assessment of Effective Guidance and Services in Public Secondary Schools: A case study of Selected Secondary Schools within Lalegu Local Government.
- Agi, C.W. (2013) Evaluation of the status of Guidance Services in Secondary Schools Rivers State, Nigeria. *Journal of Education and Practice*
- Borrow, H. (1983). *Career Guidance for new age*. Boston: Houghton Mifflin Company.
- Heled, B. and Davidovitch, N. (2019). The impact of academic, personal
- Gibson, I.L. (2018) Introduction to Guidance and Counselling. Upper Saddle River, NJ: Prentice Hall.
- Heyden, S. M. (2011). *Counseling children and adolescents*. Belmont, CA: Brooks / Cole.
- Kothari. (2005). *Research Methodology: Methods and Techniques*. Inyata: KWTS Publishers.
- La'ah, D. (2015). An Evaluation of Teachers Utilization in Zaria Secondary Schools: Implications for Guidance and Counselling. *Academic Research International*.
- Lindsay. (1983). *Problems of Adolescence in Secondary Schools*. London: Room Helm.
- Makinde, O. (1984). *Fundamentals of guidance and counselling*. London: Macmillan Education Limited.
- Mutie, E. K., & Ndambuki, P. (2000). *Guidance and counselling for secondary school and colleges*. Nairobi: Oxford University Press.
- Ndirangu, (2007) PN. The influence of guidance and counselling programme on academic performance of selected public secondary school students: A case of Bahati Division, Nakuru (Doctoral dissertation, Egerton University), 2007.
- Popov, N. and Spassenovic, V. (2020) School Counselling: A comparative study in 12 countries. Bulgarian Comparative Education Society
- Pravat, K. D. (2023) Guidance and Counselling in Teacher Education SSRN Electronic Journal
- Rayees, A.D. and Najmha, P. (2021) Importance of Guidance and Counselling in Effective Teaching and Learning in Schools. DOI:10.31426/ijamsr.2018.1.9.332

Susanna Wai Ching Lai-Yeung, (2014) /Procedia-Social and Behavioral Sciences (2014).

Umberson, D. Montez, J.K. (2010) Social Relationships and Health: A flashpoint for public policy. *Journal of Health and Social Behavior*. (2010;51: S54-S54-S56.

## ASEI-PDSI APPROACH LEVEL OF AWARENESS OF AMONG MATHEMATICS AND SCIENCE EDUCATION STUDENT IN SOKOTO STATE UNIVERSITY

<sup>1\*</sup>Aliyu Garba, <sup>2</sup>Hassan Aliyu & <sup>3</sup>Faruku Aliyu

<sup>1\*</sup>Department of Science Education,  
Faculty of Education,  
Sokoto State University, Sokoto  
Email: [aliyu.garba@ssu.edu.ng](mailto:aliyu.garba@ssu.edu.ng)<sup>1\*</sup>, [nagoronyo@gmail.com](mailto:nagoronyo@gmail.com)<sup>2</sup>, & [faruku.aliyu@ssu.edu.ng](mailto:faruku.aliyu@ssu.edu.ng)<sup>3</sup>

---

### Abstract

*To assess the current level of awareness towards Activity Students Centred and Improvisation Plan Do See Improve ASEI-PDSI Approach among Mathematics and Science Education Student in Sokoto State University the Study designed level of awareness of ASEI-PDSI approach among mathematics and science education student Questionnaire (LAOAMASEQ). The main objective of this study was to expose Mathematics and Science student's teacher to the new approach and assess the level of awareness of ASEI-PDSI Approach and gender disparity. Data were collected from a sample of 217 respondents. From the result, majority of the respondents portrayed very little knowledge about ASEI-PDSI Approach. So also, there is no significant difference between male and Female students with regards to ASEI-PDSI level of awareness among mathematics and Science education students' teachers in Sokoto state university. The findings recommended that the module should be develop for mathematics and Science education students' teacher in tertiary institutions, Government should encourage SMASE INSET and Government should integrate ASEI PDSI approach into teacher education programmes among many more.*

**Keywords:** ASEI PDSI, Awareness, Gender, Mathematics Education, Science Education

### Introduction

Mathematics and sciences are very fundamental and crucial subject in the primary, secondary school and tertiary institutions. Despite its reputation; students' achievement and interest are reportedly very low. It is outward worrisome if such is the situation in our schools observing how hard it is to live a meaningful life in the present innovative and creative world without the good knowledge of mathematics and science. The teaching and learning of these subjects, are imperative in every civilisation if the tenants are to cope with the fast-changing development in technology and engineering. Moreover; Mathematics and science are academically stimulating subject that affects every facet of human hustle such as business, politics, engineering and technology (Garba, 2018). The importance of mathematics and science to man has accounted for its inclusion in school curriculum. The significance of mathematics and Science for human lifecycle has crucial value for its presence in school curriculum as an imposed subject for every beginner of school to acquire the appropriate mathematical and scientific skills that will enable him endure with life challenges. With regards to this, the Federal Government of Nigeria

through the National Policy on Education (FGN, 2013) stated that mathematics and basic science should be taught as a core subject to all students at basic and secondary school level in order to give a sound root for scientific and technological thinking skills, and concoct them for the next level of Instruction.

Furthermore, the position of mathematics and science does not only depend on its contributions to scientific and technological development but also in its usefulness to daily interactions at the market places, transportations, business of all sorts by both knowledgeable and common man of the society. Unfortunately and Regrettably, researchers for instance, Hassan & Shahid (2019) and others have shown that students' achievement in these very important subjects (mathematics and science) over the years has not been positive at the basic, secondary and even at tertiary institutions of education in Nigeria. Parents and government are in upset about the current condition of mathematics and science education in Nigeria. This is because a credit pass needed for candidate to be admitted into tertiary institution is in sorry state. As Asikhia (2014) stated, that so many students at tertiary institutions in Nigeria today are not studying the courses they wanted to study because of not making the required SSCE grades in English, Mathematics and science subjects related area to gain admission to courses wanted to study.

According to Morsanyi et al. (2014), students need methods of instruction that are proper for the better emphasis on problem solving, higher order thinking skills and applications. Morsanyi et al furthermore believed that, an instruction modes as cooperative learning that allows students to carry out particular task together in problem-solving circumstances, to pose questions, analyze situations, try different strategies and check for rationality of results are required in teaching and learning process. The teaching of mathematics and science should therefore not be about dispensing rules, definitions and procedures for students to memorize, but engaging students as active participants through various activities, discussion and collaboration among the students (Dangpe, 2015).

The curriculum clearly specifies the use of activity method in the teaching and learning of mathematics and science by providing the performance objectives, content, students and teachers activities as well as teaching and learning materials. On the other way round, the practice by teachers in the Conventional teaching strategy (CTS) does not make reference to these emphasized suggested activities spelt out in the curriculum.

The result as shown by Dangpe (2015); was that students are passive in most of our classroom situations and thus continue to record low achievements in mathematics and science subject. Regardless of the positions, there were no much efforts by researchers to outline the procedures in integrating Activity Student Centred and Improvisation- Plan Do See Improve (ASEI-PDSI) approach into teacher education programme. Garba, (2022) pointed out that most of our teachers are using what we called students cantered learning thereby dominating the classroom and is one of the contributing factors toward low achievement of students' academic performance. This study is therefore attempting to fill that gap, this study also therefore taking a look at Experiment and Improvisation approach with a view to strengthening mathematics and science education.

The ASEI/PDSI Approach is used as a means of instruction in classroom for teaching and learning processes and it is paradigm shift from traditional to activity-based approach and Table 1 is showing the changes from Pre-ASEI/PDSI to ASEI/PDSI, the approach has its principles, guideline and peculiar lesson plan which will be discuss in the training module



**Table 1:** The changes from Pre-ASEI/PDSI to ASEI/PDSI

<b>PRE-ASEI/PDSI</b>	<b>SMASE ASEI/PDSI Experiences:</b>	<b>After Experience in ASEI PDSI</b>
<ul style="list-style-type: none"> <li>• Knowledge based teaching</li> <li>• Teacher-centred teaching, chalk and talk mostly</li> <li>• Full rule experimentations</li> </ul>	<ul style="list-style-type: none"> <li>• Attitudinal changes by the individual</li> <li>• PDSI</li> <li>• Pedagogy</li> <li>• Material</li> <li>• Production</li> <li>• Capacity building</li> <li>• INSET</li> </ul>	<ul style="list-style-type: none"> <li>• Learning is student centeredness</li> <li>• Activity-based teaching</li> <li>• Experiment And researches</li> <li>• Improved performance and achievement.</li> </ul>

To determining whether it will bring the required improvement in students’ achievement and interest in mathematics and science education, This Activity Students centred Experiment and Improvisation approach in Nigeria, has its origin in line with the arrangement between the Federal Ministry of Education. (FME) and Japan International Cooperation Agency (JICA). The Federal Ministry of Education & Japan International Cooperation Agency (2007) pinpoints out that various studies (including the National Assessment of Learning Achievement in 1997, 2001 and 2003) have revealed that students’ performance, specifically in primary and secondary mathematics and science education, are very poor. However, In 2005 the Federal Ministry of Education (FME) of Nigeria, in collaboration with Japan International Cooperation Agency (JICA), carryout a baseline study on primary mathematics and science education in three states in Nigeria. The study revealed that schools faced serious challenges in the teaching of mathematics and science: teachers were busy in what we called the “chalk and talk” method of teaching and pupils were passive recipient in most of our classroom situation. From 2007 to this 2024, several attempts were made to cascade circle 1,2,3 and 4 to the primary schools’ science and mathematics teachers but were faced with a lot of challenges. Federal and state government were spending huge number of resources to carry out the project and the process are in sorry stage; hence the researchers find it of great important to bridge the gap by integrating the mentioned approach into mathematics education and science education Programmes in sokoto state university, Nigeria

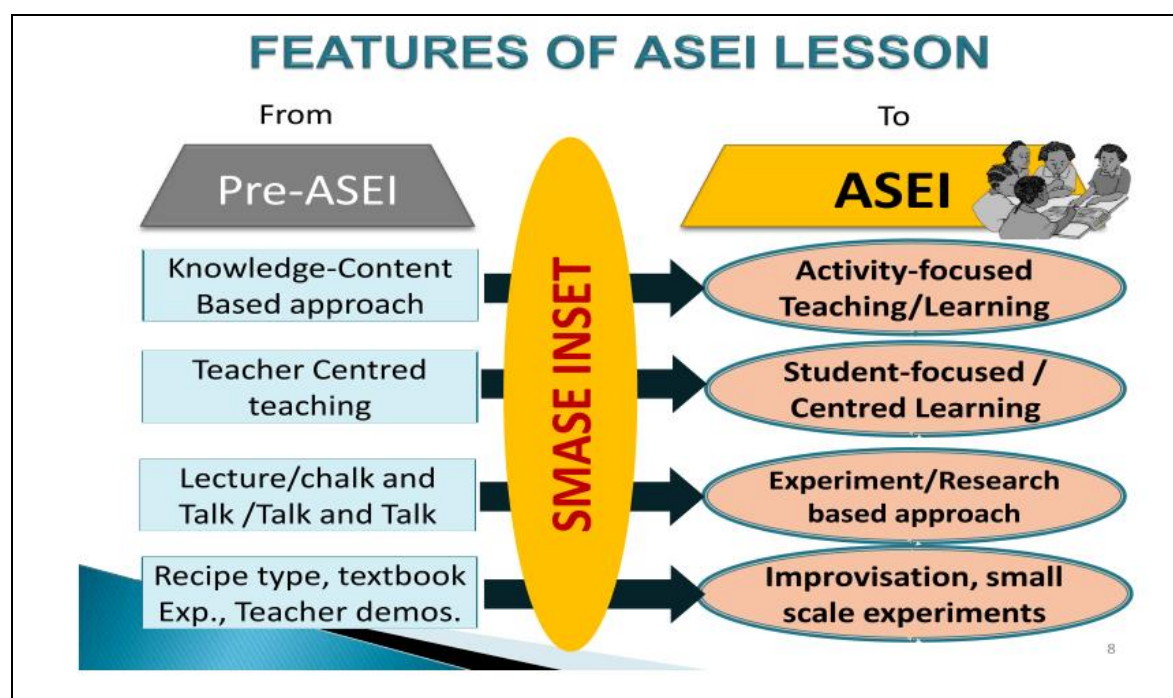
Zalmon & Wonu, (2017) explained that mathematics and Sciences are pre-requisite for giving admission into science related subject and technology-based course in Nigeria. However, the guideline in Nigeria education system for one to be given admission to science related subjects into university must have at least five Credits passes in the science related courses of study with mathematics and English language inclusive. According to national policy on education mathematics and science teachers are expected to used what we called students centred and practical approach in the classroom situation but sorry to say the reverse is the case. The performance of students in mathematics and science has been somewhat unsatisfactory over the years in Nigeria largely in Sokoto State. The external examination bodies the West African Examination Council (WAEC) have repeatedly reported the poor performance of students in mathematics., the annual report of west African examination council (WEAC) of the years; 2013, 2014, 2015, 2016

and 2017 which showed the percentage of students with five credits including mathematics with respective pass credits as 7.12%,7.18%,16.84%,29.37% and 31.85% however the 2022 WEAC Examiners report showed that the students have difficulty in solving mathematical problems that require mathematical geometrical concepts that has to with some activities. However, in science related area the students are facing challenges in some practical related topics. Students' low success levels in mathematics and science have been a worry for a long time in many countries, with Nigeria inclusive. There are a lot of factors said to be affecting success in mathematics and science Birgin et al., (20106) . One of these according to Morsanyi et al. (2014) is the conventional form of teaching mathematics and science which has been recognized as being ineffective and as one of the major factors accountable for the poor performances of students in mathematics and science subject. In addition, among several reasons keen out by different scholars, Siocha & Nyagaka (2021) was of the opinion that, poor learning interest and assimilation of mathematics and scientific thoughts, concepts, principles, methods and teachers' failure to use appropriate and stimulating teaching methods are responsible for students' low achievement in mathematics in Nigeria (still, much attention has been directed towards the study of mathematics at the primary and secondary levels of education as to improve students' achievement and interest) regrettably, this has not given the required result of achievement in our schools. Therefore, the search towards more strategies for improving the teaching and learning of mathematics continues. Obomanu & Adaramola, (2011) noted that there is generally low interest in the study of mathematics and science related disciplines at all levels of education in Nigeria. Obomanu added that in most secondary schools in Nigeria, students absented themselves in mathematics lessons and that those who stay in the lessons pay little or no attention to their teachers. Devine et al., (2012) concluded that the question of how to motivate students in the classroom has become a leading concern for teachers of all disciplines.

### **Concept of Activity Students Centred Experiment and Improvisation (ASEI) Approach**

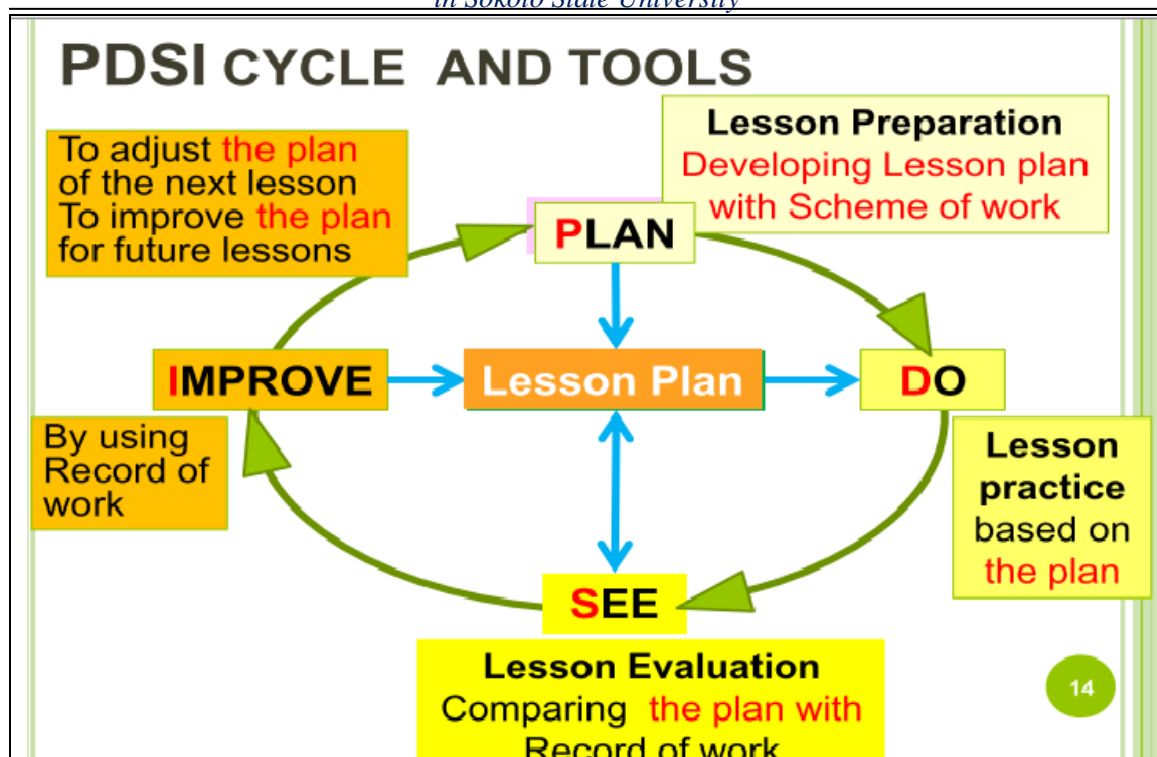
The Government of Kenya in its vision 2030 has named education as one of the mainstays for engrossing Kenya into a commercial country described by Kwamboka, (2012). Accordingly, that the government faced, (2007) an urgent demand to improve Mathematics and Science Education at primary and secondary levels, to develop human resources needed to support such industrialization. It is in this background that Japan sponsored a project for Strengthening Mathematics and Science Education (SMASE)" for five years from 1998, providing in-service training in mathematics and science in nine selected districts. The phase II of the project was carryout from July 2003 to June 2006 purposely to establish discussion and exchange of ideas between Japanese and Kenyan experts, the project accepted a unique approach. This approach encouraged teachers to carry out an activity and innovative lessons using mathematics and Science experiments and practices. This method of lesson innovation is an experiment and improvisation approach called the ASEI (Activity, Student Centred, Experiment, and Improvisation) approach, aiming at making teaching and learning more student-centred rather than more of teacher centred. The project has also successfully introduced the PDSI (Plan, Do, See and Improve) method, which encourages teachers to constantly fine-tune their curricula according to the students' learning achievement and educational needs with full of experimentation throughout the process of teaching and learning processes. The aspect of Plan, Do, See and Improve (PDSI) follows its literal meaning thus this sums up what Emeji, (2021) says it is synonymous to inductive method, guided discovery, activity

learning, and learner- centre instruction. The discovery method which is tantamount with this approach and is defined as a teaching technique that boosts students to take a more active participation in their learning process by answering a bchain of questions or solving problems designed to introduce a general concept (Mayer, 2003). Mayer credited Jerome S. Bruner as a highly influential cognitive psychologist, responsible for the development of discovery method into an accepted instructional technique. The discovery method to Bruner is based on the notion that learning takes place through classification and schema formation.



**Figure 1:** Assessing ASEI lessons (II) (Nicholas, 2013)

The Figure 1 is feature of ASEI lesson gives a diagrammatic summary of the conceptual framework of ASEI from pre-ASEI to the actual ASEI condition as given by Nicholas (2013). In essence, the student becomes active in the learning process while the teacher carefully guides the process.



**Figure 2:** PDSI Cycle and Tools

Figure 2 gives a pictorial illustration of what actually happens during the whole process of lesson preparation and the actual excursion of the lesson process.

### Training of mathematics and science education

In the past, great efforts have gone into ensuring qualified teachers and provision of equipment and materials, but in most cases mathematics and science teachers remain inadequate in most African countries. Even where they are adequate, quality of students' achievement in mathematics and sciences education is not always high. It is with this background that the attention is now drawn to what classroom practices, utilization of the available equipment and materials, and approaches and methodologies that are employed in content delivery Siocha & Nyagaka, (2021). This is a critical component to the answer to mathematics and science education problem. This is the basis for the Strengthening Mathematics and Science in Secondary Education (SMASSE) project with an In-Service Education Training (INSET). Teachers remain one of the most important human resources that a country can have. This is because the efficient human capital development depends partly on the quality and effectiveness of the teachers. The quality and effectiveness of the teacher is among others a function of the talent and the training. Additionally, training of teachers is one of the most important aspects of curriculum development and implementation in any education system. Ideally training of teachers should have a pre- service and in-service component.

### Teachers' perception on Mathematics and Science subject

Whyte and Anthony (2012) reported that mathematics and science nervousness emanated from the teaching. People generally are anxious before going to schools. The traditional approach to teaching is one of the causes of mathematics and science anxiety (Mutodi & Ngirande, 2014).

According to Finlayson (2014) in a study conducted for pre-service science education teachers, stated that one of the prime factors that contributed towards the students' anxiety is the teacher behavior. Bursal and Paznokas (2006) found that negative attitude towards mathematics and science subject does not affect only mathematics and science education but also engineering and technology. This negative attitude towards mathematics and science subject affects students' ability in solving scientific mathematical problems in chemistry, biology, physics and other related technological and engineering subjects. In the same vein, teachers' in appropriate method of teaching contributed immensely toward the loss of interest in the area of mathematics and science related subject (Geist, 2015). Some pre-service teachers are attributed to poor conception of correct pedagogy to be use in teaching particular topics (Finlayson, 2014). Mathematics and science are an important subject that needs to be given positive perceptions, caring and full involvement of potential mathematics and science teachers showing and exhibiting certain characteristics that will arouse and stimulate the interest in teaching and learning processes. It is known that some regular mathematics teachers experience mathematics anxiety also. Whyte and Anthony (2012) reported subject anxiety emanated from teaching and some believed of the learner. People generally are not mathematics anxious before going to schools. The traditional approach to teaching mathematics is one of the causes of mathematics anxiety (Mutodi & Ngirande, 2014).

As reported by Tobias, Serow & Schmude (2009) Pre-Service, teacher's poor self-conception of themselves as teachers contributes to the massive failure in particular subject. . Instructions need to be given to the learner by the teacher with a higher level of self-conception. In a situation whereby a teacher cannot portray self-conception with concrete realities of subject application, it reinforces the students' perceptions that subject is difficult and it is abstract. There are some topics in mathematics and science which students find difficult to understand such topics create fear and low interest towards the subject (Olubukola, 2015). For some topics in the present secondary schools and tertiary institutions curricula, teachers cannot expose their students to experience it in real life situation outside the schools. Traditionally, students are encouraged to memorize some mathematical and scientific concept without comprehending the real skills and application to a real-life situation (Rosnan, 2006).

In his research Emeji (2021) the result indicated that students in basic science performed significantly better when taught using ASEI-PDSI Approach than when they were exposed to discussion and demonstration methods. He furthermore added that significant difference could be as a result of involvement of students in class work or learning activities which is the child-cantered and participatory aspect of ASEI that leads to constructivism, learning and causes retention in what is learnt.

### **Level of awareness of ASEI-PDSI**

Based on the past research and observation the level of awareness towards Activity Students Centred and Improvisation Plan Do See Improve ASEI-PDSI Approach among Mathematics and Science Education Students reported minimal according to (Katiambo, 2019) there is little knowledge about the concept of ASEI-PDSI approach among mathematics and science.



## **Learners Gender**

Based on the pass research presenting conflicting opinions on gender disparity in mathematics and science subject, this study is to examine whether or not the ASEI-PDSI approach has direct influence on gender with regards to interest and achievement of the learner. According to Jordan, (2017) when the test score data were disaggregated on the base of race and gender, there was no proof of an achievement gap. In another study Teachers' positive attitudes towards male students are a reflection of the broader societal biases about the role of women on the society and the academic capacity of girls (Siocha & Nyagaka, 2021).

Numerous approaches were employed to improve students' performance in school subjects in Nigeria. Based on this the researchers argues that the teaching of mathematics and science could be improved with the use of experiment and improvisation-based approach as ASEI/PDSI approach rather than the conventional teaching strategy. Thus area of mathematics and science could be achieved when an appropriate instructional strategy as the experiment and improvisation based approach is used in teaching and learning where the learners are made to see the importance of what they are about to study. Interest is developed when learning is based on students-centred principles. Some researchers noted that interest has a strong influence on individual's cognitive and affective functioning but the way interest interacts. and through what processes they influence learning has not been clearly established. The researchers remarked that in addition to more standard quantitative and qualitative methodologies, the complexity of academic development in specific domains require the creation of alternative techniques that document and describe the influence of interest on students' learning. Hence, the need to investigate the students' level of awareness on experiment and improvisation-based approach became very important.

Similarly, gender issues are yet inconclusive, gender implication especially as it affects students' achievement and interest in these subjects need more verification. However, the use of experiment and improvisation-based approach found in ASEI/PDSI in the teaching and learning of mathematics and science. This was what prompted the research on exposition of experiment and improvisation approach through Activity, Students' Experiment and Improvisation/Plan, Do, See and improve ASEI PDSI on level of awareness, gender disparity, in the area at Sokoto state university for science education students' teacher. Therefore, the problem of the study put in question form is would experiment and improvisation-based model as ASEI/PDSI be an effective way of improving students' achievement and interest in teaching and learning of mathematics and science subject

## **Objectives of the research**

The findings of this research will be of great significant to many stakeholders such as researchers, teachers, policymakers in education, students, school administrators and society as a whole. Moreover, the study will be of great significance to the policymakers because it will provide a yardstick that will provide an avenue for them to identify their contribution toward proving effective strategy for teaching and learning of mathematics and science subject.

The students/Pupils are one of the main targets of the study. Hence, the study is significant because it will assist them to appreciate the power of the activity based



teaching and learning approach which will definitely improves their creativity and innovative skills which if they were properly exposed to the approach will yield good performance in the area.

The main objects of this study is to find out the is to expose Students’ teacher on Activity, Students, Experiment and Improvisation (ASEI)/Plan, Do, See and Improve (PDSI) approach Specifically, therefore in this paper the study is to:

- I. Investigate the level of awareness of ASEI-PDSI Approach among Mathematics and Science education student in Sokoto State University.
- II. Examine Influence of gender on the level of awareness of ASEI-PDSI Approach among Mathematics and Science education student in Sokoto State University.

### Research questions

The study would be guided by the following research questions:

- I. What is the level of awareness of ASEI-PDSI Approach among Science education and mathematics education student in Sokoto State University?
- II. What is the Influence of gender on the level of awareness of ASEI-PDSI Approach among Mathematics and Science education student in Sokoto State University.

### Methodology

#### Research Design

The research design is descriptive survey design. This type of research involves collection of data through self-developed instrument (questionnaire) .The questionnaire is easy to collect data from the respondents. In addition, it identifies the characteristics of the respondents because as it is, without changing or modifying the situation under investigation as literature expounds (Sambo, 2000).

#### Population of the Study

The population for this study consists of all the science education students of Sokoto state university. There are total number of 456 students in five Programmes in the department of science education, faculty of education, Sokoto state university.

**Table 2:** Department of Science Education’s Students per Programme

Programme /Level	Education Biology	Education Chemistry	Education Computer	Education mathematics	Education Physic	Total
UG I	37	30	26	5	7	<b>105</b>
UG II	44	22	26	9	10	<b>111</b>
UG III	52	27	26	9	7	<b>121</b>
UG IV	52	31	20	9	7	<b>119</b>
<b>total</b>	<b>185</b>	<b>110</b>	<b>98</b>	<b>32</b>	<b>31</b>	<b>456</b>

#### Sample and Sampling Techniques

Stratify systematic random sample was employed. The sample for this study were taken out of the total population of the science education department students in the faculty of

education Sokoto State University. The total number of five units namely; Education biology, Education Chemistry, Education Computer, Education Physics and Education Mathematics were considered with the total population of 456 students out of which sample size of 217 respondents at 5% margin error and 95% significant level using research advisor table was selected.

### ***Research Instrument***

The instruments to be used for the purpose of this study will be training module named; ASEI-PDSI approach for mathematics and science teacher Training Module (ASEI-PDSI TMMST), Semi-Structured interview will be generated on the perception of student teachers' achievement and interest. Another instrument to be use is Student teacher level of awareness and gender influence on ASEI-PDSI approach Questionnaire (STLAGIAQ) with Five Likert options scale.

### ***Validity of the Instrument***

Level of awareness of ASEI-PDSI approach among mathematics and science education student Questionnaire (LAOAMASEQ) were be given to experts in the Department of Science Education, faculty of education for the face validity, observations, correction and observation were taken into considerations.

### ***Reliability of the Instrument***

Level of awareness of ASEI-PDSI approach among mathematics and science education student Questionnaire (LAOAMASEQ) was tested using Cronbach alpha method to establish the reliability score of the instrument.

### ***Method of Data Collection***

Data will be collected from the respondents by using (LAOAMASEQ) questionnaire. The questionnaire was administered by the researcher and research assistants to the targeted respondents over 217 participants.

### ***Method of Data Analysis***

The data was collected from the respondents and analysed with the use of statistical package for social science (SPSS) version 16.0. Descriptive statistics with the use of frequencies, percentage and t test was used to analysed the Data.

## **Result**

**Table 3: Gender Distribution**

<b>Gender</b>	<b>Number</b>	<b>Percentage (%)</b>
Male	147	68.70
Female	70	32.30
<b>Total</b>	<b>217</b>	<b>100</b>

Table 3 reveals that while over 68% of the respondents are male, not more than 32% are female. This shows that there are more respondents than their female counterpart.

**Table 4:** ASEI PDSI assessment scale

No	Test Items	Correct Response (%)		Incorrect Response (%)		Total
		male	Female	male	Female	
1	Choose the sentence that describe the full meaning of ASEI	13(5.9)	7(3.2)	134(61.8)	63(29.1)	217
2	Choose the sentence that correctly describe the meaning of PDSI	15(6.9)	8(3.7)	132(60.8)	62(28.6)	217
3	The Fundamental Features of ASEI PDSI Lesson Plan are as Follows	12(5.5)	6(2.8)	135(62.2)	64(29.5)	217
4	The Following are the Feature of ASEI PDSI Approach that has to be taking into consideration:	16(7.4)	9(4.15)	131(60.37)	61(28.1)	217
5	Select the most appropriately Sentence that describes the acronyms SMASE	14(6.5)	9(4.15)	133(61.3)	61(28.1)	217
6	Choose a sentence that most appropriately describes the tip for better actualization of ASEI lessons in classroom	17(7.8)	8(3.7)	130(59.9)	62(28.6)	217
7	Choose a sentence that most appropriately describes the way to give instructions to pupils in ASEI PDSI Approach.	12(5.51)	8(3.7)	135(62.21)	62(28.6)	217
8	Choose a sentence that most appropriately describes teachers' questioning techniques in ASEI lessons	12(5.5)	6(2.8)	135(62.2)	64(29.5)	217
9	SMASE promotes peer teaching as a part of lesson preparation. The peer teaching is followed by a review meeting. Which of the options below is INAPPROPRIATE as an agenda of review meetings after peer teaching?	13(6.0)	5(2.3)	134(61.8)	65(30.0)	217
10	Which statement is INAPPROPRIATE as a check list for assessing ASEI lessons?	10(4.6)	10(4.6)	137(63.1)	60(27.6)	217
<b>Total</b>		<b>134</b>	<b>76</b>	<b>1336</b>	<b>624</b>	<b>2170</b>

With regards to the sentence that describe the full meaning of ASEI, 5.9% of the Male respondents answered it correct and 3.2% of the female respondents answered it correct so also 61.8% of the Male respondents answered it not correct 29.1% of the female respondents answered it not correct. Choose the sentence that correctly describe the meaning of PDSI

With regards to the sentence that correctly describe the meaning of PDSI 6.9% of the Male respondents answered it correct 3.7% of the female respondents answered it correct however 60.8% of the Male respondents answered it not correct and 28.6% of the female respondents answered it not correct

In another facet the sentence that describe the Fundamental Features of ASEI PDSI Lesson Plan 5.5% of the Male respondents answered it correct 2.8% of the female respondents answered it correct however 62.2% of the Male respondents answered it not correct and 29.5% of the female respondents answered it not correct

In another development Feature of ASEI PDSI Approach that has to be taking into consideration 28.1% of the Male respondents answered it correct and 7.4% of the female respondents answered it correct However 4.15 % of the Male respondents answered it not correct 60.37% of the female respondents answered it not correct.

With regard to the Selection of the most appropriately Sentence that described the acronyms SMASE 6.5% of the Male respondents answered it correct and 4.15% of the female respondents answered it correct However 61.3% of the Male respondents answered it not correct and 28.1% of the female respondents answered it not correct.

In a sentence that most appropriately describes the tip for better actualization of ASEI lessons in classroom (7.8) of the Male respondents answered it correct and (3.7) of the female respondents answered it correct However (59.9) of the Male respondents answered it not correct and (28.6) of the female respondents answered it not correct.

In the sentence that most appropriately describes the way to give instructions to pupils in ASEI PDSI Approach. 5.51% of the Male respondents answered it correct and 3.7% of the female respondents answered it correct However 62.21% of the Male respondents answered it not correct and 28.6% of the female respondents answered it not correct.

In a sentence that says most appropriately describes teachers' questioning techniques in ASEI lessons 5.5% of the Male respondents answered it correct and 2.8 % of the female respondents answered it correct However 62.2% of the Male respondents answered it not correct and 29.5% of the female respondents answered it not correct.

In sentence that says SMASE promotes peer teaching as a part of lesson preparation. The peer teaching is followed by a review meeting. Which of the options below is INAPPROPRIATE as an agenda of review meetings after peer teaching? 6.0% of the Male respondents answered it correct and 2.3% of the female respondents answered it correct However 61.8% of the Male respondents answered it not correct and 30.0% of the female respondents answered it not correct.

In a question "Which statement is INAPPROPRIATE as a check list for assessing ASEI lessons"? 4.6% of the Male respondents answered it correct and 4.6% of the female respondents answered it correct However 63.1% of the Male respondents answered it not correct and 27.6% of the female respondents answered it not correct.

**Level of awareness in terms of Gender distribution**

Percentage of Male correct answers out of their total responses

$$\begin{aligned} &= tCrpM / (tCrpM + tIncrpM)* \\ &= 100 \ 134/ ( 134+1336) * 100 \\ &= 9.1\% \end{aligned}$$

Percentage Female correct answers out of their total responses

$$\begin{aligned} &= tCrpF / (tCrpM + tIncrpF )* 100 \\ &= 76/ ( 76+624) * 100 \\ &= 10.8\% \end{aligned}$$

Percentage of Male Incorrect answers out of their total responses

$$\begin{aligned} &= tInCrpM /(tCrpM + tIncrpM)*100 \\ &= 1336/ (134+1336) * 100 \\ &= 90.9\% \end{aligned}$$

Percentage Female Incorrect answers out of their total responses

$$\begin{aligned} &= InCrpF /(tCrpM + tIncrpM)*100 \\ &= 624/( 76+624) * 100 \\ &= 89.2\% \end{aligned}$$

There was no significant difference between male incorrect response 90.9% and their counterpart female of about 89.2% at  $P < 0.05$

Where tCrpM is the total correct responses of male

tIncrpM is the total incorrect responses of male

tCrpF is the total correct responses of Female

tIncrF is the total incorrect responses of Female

**Discussion**

With regards to full meaning of ASEI, PDSI, Fundamental Feature ASEI PDSI, its lesson plan and some respondents are not aware about the concept this in conformity with the findings of Katiambo, (2019) who stated that there is little knowledge about the concept of ASEI-PDSI approach among mathematics and science. When it comes to the actualization of ASEI PDSI approach in classroom situation which comprised the last five Items of the questionnaire most of the respondents showed drastic level of unawareness of the approach which also Support the above finding.

With regards to Level of awareness in terms of gender distribution there was no significant difference between male level of unawareness of about 90.9% and their counterpart female of about 89.2% out of their total responses at  $P < 0.05$  which portrayed the level of unawareness concerning the concept. According to Jordan, (2017)

when the test score data were disaggregated on the base of race and gender, there was no proof of an achievement gap, this was in total agreement with the above finding

## **Conclusion**

ASEI PDSI approach is a new approach in Nigeria in most cases teachers at Basic and secondary level are not familiar with this new approach. Few of those that are aware are not implementing the principles. The beauty associated with the actualization of this approach in the teaching and learning of Mathematics and science cannot be over emphasized. It encourages creativity, improve skills of improvisation of instructional materials when the conventional ones are not available and facilitate active participation on the part of the teachers and learner.

## **Recommendations**

- I. The government should encourage Basic and Secondary level school teachers to be attending SMASE training
- II. Proper monitoring and Supervision should be given priority at level of school system for fully implementation of the new approach
- III. Modules should be provided in SMASE training Centre
- IV. Government should integrate ASEI PDSI approach into teacher Education programmes

## **References**

- Asikhia, O. . . (2014). Effect Of Cognitive Restructuring On The Reduction Of Mathematics Anxiety Among Senior Secondary School Students In Ogun State , Nigeria. *International Journal of Education and Research*, 2(2), 1-20.
- Birgin, O., Balo, M., Hakan, H., & G Ramazan, R. (2010). An investigation of mathematics anxiety among sixth through eighth-grade students in Turkey. *Learning and Individual Differences*, 20(6), 654-658. <https://doi.org/10.1016/j.lindif.2010.04.006>
- Bursal, M., & Paznokas, L. (2006). Mathematics anxiety and preservice elementary teachers' confidence to teach mathematics and science. *School Science and Mathematics*, 104(6), 173-180. <https://doi.org/10.1111/j.1949-8594.2006.tb18073.x>
- Dangpe, A. K. D. (2015). *Effects Of Experiment And Improvisation Based Model On Students' Achievement And Interest In Circle Theorems*. University of Nigeria, Nsukka, Enugu State, Nigeria.
- Devine, A., Fawcett, K., Szűcs, D., & Dowker, A. (2012). Gender differences in mathematics anxiety and the relation to mathematics performance while controlling for test anxiety. *Behavioral and Brain Functions*, 8(1), 33. <https://doi.org/10.1186/1744-9081-8-33>
- Emeji, E. O. (2021). *Effects of using ase-i-pdsi approach of teaching on the academic performances of students in basic science in junior secondary schools*. 9(2), 1467-1474.
- Finlayson, M. (2014). Addressing math anxiety in the classroom. *Improving Schools*, 17(1), 99-115. <https://doi.org/10.1177/1365480214521457>



- Geist, D. E. (2015). Math anxiety and the “math gap”: How attitudes toward mathematics disadvantage students as early as preschool. *Journal of Instructional Psychology*, 135(3), 328-337.
- Hassan, A., & Shahid, M. A. (2010). Scholars, Merchants and Civil Society: Imperative For Waqf-Based Participatory Poverty Alleviation Initiatives In Kano, Nigeria. In A. G. Ismail, M. E. M. Hassan, N. Ismail, & S. Shahimi (Eds.), *Management and Development of the Awqaf Assets* (pp. 309–328). <https://doi.org/10.1109/INCOS.2010.100>
- Jordan, W. J., & Education, U. (2017). *Mathematics Confidence In An Urban High School : Black Students ' Perception Of Mathematics Education*. May.
- Katiambo, D. (2019). *Effect of ASEI-PDSI SMASSE Approach to Teaching on Mathematics Learning Outcomes in Secondary Schools in Kenya*. Kenya: Kibabii University.
- Morsanyi, K., Busdraghi, C., & Primi, C. (2014). Mathematical anxiety is linked to reduced cognitive reflection: a potential road from discomfort in the mathematics classroom to susceptibility to biases. *Behavioral and Brain Functions: BBF*, 10(1), 31. <https://doi.org/10.1186/1744-9081-10-31>
- Mutodi, P., & Ngirande, H. (2014). Exploring Mathematics Anxiety: Mathematics Students' Experiences. *Mediterranean Journal of Social Sciences*, 5(1), 283–294. <https://doi.org/10.5901/mjss.2014.v5n1p283>
- Obomanu, B. J., & Adaramola, M. O. (2011). Factors Related to Under Achievement in Science, Technology and Mathematics Education (STME) in Secondary Schools in Rivers State, Nigeria. *World Journal of Education*, 1(1), 102-109. <https://doi.org/10.5430/wje.v1n1p102>
- Olubukola, A. (2015). An Investigation of Difficult Topics in the Senior Secondary School Mathematics Curriculum as Perceived by Student Teachers. *American Journal of Educational Research*, 3(7), 844-848. <https://doi.org/10.12691/education-3-7-7>
- Rossnan, S. (2006). Overcoming Math Anxiety. *Mathitudes*, 1(1), 1-4. <https://doi.org/10.1007/BF03024518>
- Siocha, N., & Nyagaka, E. (2021). *International Journal of Applied Science and Research Overview Of Girls' Performance In Biology Subject In Kenya Certificate Of Secondary Education: What Is The Way Forward? April 2000*, 198–207.
- Tobias, S., Serow, P., & Schmude, M. (2009). Critical Moments in Learning Mathematics : First Year Pre-service Primary Teachers ' Perspectives. *Proceedings of the 33rd Annual Conference of the Mathematics Education Research Group of Australasia*. Fremantle: MERGA, 804-811.
- Whyte, J., & Anthony, G. (2012). Maths Anxiety: The Fear Factor in the Mathematics Classroom. *New Zealand Journal of Teachers'*, 9(1), 6-15. [http://www.teacherswork.ac.nz/journal/volume9\\_issue1/whyte.pdf](http://www.teacherswork.ac.nz/journal/volume9_issue1/whyte.pdf)

## GENDER DIFFERENCES ON ACHIEVEMENT AND ATTITUDE IN CONCEPT LIGHT WAVES IN SENIOR SECONDARY SCHOOL STUDENTS IN KAGARKO LOCAL GOVERNMENT, KADUNA STATE

<sup>1\*</sup>Akuso Simon, <sup>2</sup>Orji Nwokedirioha Onyemaechi & <sup>3</sup>Ode John Segun

<sup>1,2&3</sup>Department of Science and Environmental Education,  
Faculty of Education,

University of Abuja, Abuja, Nigeria

Email: [akusosim12@gmail.com](mailto:akusosim12@gmail.com)<sup>1</sup>, [orjinwokedi2018@gmail.com](mailto:orjinwokedi2018@gmail.com)<sup>2</sup> & [johnsegunode@gmail.com](mailto:johnsegunode@gmail.com)<sup>3</sup>

---

### Abstract

*This study examined the Gender Differences on Achievement and Attitude in Concept Light Waves in Senior Secondary School Students in Kagarko Local Government, Kaduna State. The study adopted pre-test and post-test quasi-experimental research design. The population of the study consists of 2,431 (1,143 boys and 1,288 girls) senior secondary school two (SSII) students from public schools during the 2020/2021 academic session in Kagarko local government area, Kaduna state. A sample size of 45 (26 Male and 19 Female) SSII Physics students were selected from the target population using simple random sampling technique. The students were exposed to light waves concept using Activity-Based Strategy. Two instruments, namely Physics Achievement Test (PAT) and Physics Attitude Scale (PAS) were used for data collection and had reliability coefficient of 0.82 and 0.74 respectively. Two research questions were raised with two corresponding hypotheses. These hypotheses were tested using ANCOVA at 0.05 level of significance. The results of the study revealed that male and female students exposed to Activity-Based Strategy did not differ in their achievement and attitude. The study concluded that the application of Activity-Based Strategy is gender-friendly. The study recommended the provision of in-service training and retraining for teachers on the use of Activity-Based Strategy for teaching Physics.*

**Keywords:** Gender, Achievement and Attitude, Students, Light waves, Activity-Based Strategy

### Introduction

Science and technology have become crucial factors for sustainable development worldwide. This is because Science and technology contribute significantly to the quality of life in diverse areas such as; healthcare, communication, agriculture, environmental protection, nutrition, transportation, and energy production. Science and Technology are the basic requirements for any technological development in any country. According to Adam, Kime and Wali (2022), a nation can be classified as developed through its scientific and technological development. Thus, the world has identified science and technology as an important tool for national development.

The knowledge of Physics is important in understanding contemporary science and technology, and the valuable role that Physics plays in the scientific development of a

nation is never in dispute (Areo, 2022). Physics is one of the subjects in the field of science. According to Wikipedia, Physics is the scientific study of matter, energy, and their interactions. It plays a key role in the future progress of mankind. The interest and concerns of Physics education form the basis of technology. Physics generates fundamental knowledge needed for technological advancement which will in turn spearhead the economic engineering of the world (Zhaoyao, 2012). The concept learned in Physics contributes immensely to the technological infrastructure needed to make scientific advances and discoveries (Kola, 2013).

Despite the importance and significant role played by Physics education towards the development of Nigeria, there are a number of observable problems plaguing the teaching and learning of the subject, especially at the secondary school level (Areo, 2022). These problems, as observed by WAEC Chief Examiners' report (2017) include negative attitudes of students towards Physics, gender difference, poor science background among others.

Problems in teaching Physics can be minimized by selecting a suitable teaching method. The conventional method is the complete verbal presentation of the subject matter. It is characterized by a one-way mode of communication. Learners are always passive and that is inappropriate for the acquisition of practical skills as required in practically oriented subjects like Physics and lead to poor academic achievement (Achuonye, 2014).

The studies on gender disparities have been done in both developed and developing countries. In some of the countries women in institutions of higher learning tend to concentrate in certain fields of study such as humanities, home economics and arts, though more women have now enrolled in other fields like business and public administration. The enrolment in the fields such as mathematics and science related fields is however still limited (Brajraj, Rakhee, Rekha & Singh, 2019).

Fasakin (2011), recognized attitude as a major factor in a subject choice, he also considered attitude as a mental and natural state of readiness, organized through experiences exerting a directive influence upon the individual's responses to all objects and situations with which it is related. Erdemir (2009) described the attitude as the tendency of individuals who organize thoughts, emotions, and behaviors toward psychological objects. The differences in the attitude of males and females toward Physics have been an issue in many countries. In response to this, many kinds of research have been carried out with mixed reports.

No nation can aspire to achieve its full developmental potentials unless all its people, men and women, boys and girls are full participants in the process. However, the attitude and values of Nigerian society on females have apparently influenced their (female) performance in Physical Sciences at all levels of education (Adam, Kime & Wali, 2022)

Gender is one of such factors mentioned in the literature to have considerable effects on students' academic performances, especially in science subjects. One of the millennium development goals (MDGs) is gender equality. In most societies, the roles of women are not adequately recognized thus preventing women from participating in, and benefitting from development efforts. They added that some subjects such as science and mathematics are branded masculine, while others like home economics and secretarial studies are branded feminine (Amedu, 2015).

Gin (2011) observed that in the contemporary context, men and women classification is a world where patriarchal values predominate, it is a world where there are general sets of beliefs that women are inferior to men and therefore, the power relations attached to their ideas, and beliefs, give men more power, more opportunities and more conscientious over and above women in the society.

The findings of Areo (2022) showed that there was no significant influence of gender on students' achievement in Physics. It implies that female students were found to be as good as their male counterparts in achievement in Physics. Also, attitude of students towards Physics was not determined by gender. Ibrahim, Sabitu and Magaji (2016), found that there were no significant differences in the performance of male and female students in Biology, Chemistry and Physics.

Omebe and Akani (2015), study revealed that there was no gender bias in terms of achievement in Physics students' taught with instructional resources. In a similar vein Josiah (2013), found that there was no significant difference in the achievement between male and female students exposed to practical Physics approach.

Research by Katcha and Wushishi (2015), study showed that attitude change of Biology students exposed to the adequately equipped laboratory is not gender-related. Muchai's (2016), study showed that the practical approach improved male and female students' attitude toward Physics and resulted in higher students' enrolment in Physics at Kenya Certificate of secondary school Education. In agreement, Apochi, Umoru, and Onah (2018) study found that students exposed to Advance Organizer on students' interest in Biology developed a more positive interest in Biology than those taught using the conventional method. Also, indicated that there was no significant difference in students' interests based on gender.

Contrary to other findings, Yakubu (2021), study showed that there was significant difference exists between the performance of male and female students in favour of male students in Physics. In agreement with Adam, Kime and Wali (2022), findings revealed that significant gender difference between male and female students' academic performance in Physics in favour of males' students. In the same vein Brajraj, Rakhee, Rekha and Singh, (2019), study showed that there is a significant level of attitudinal differences towards science subjects between male and female students at secondary school level and that might be influencing the enrolment at higher level of studies in science streams.

### **Problem Statement**

The teaching and learning of Physics in most classrooms face a lot of problems on gender differences. Most of the teachers use the conventional teaching method that comprises talk and chalk, note taking and memorization. They do not make use of Activity-Based Strategy, where the learners play an active role in the learning process in respective of their gender. This inability of the Physics teachers in the use of Activity-Based Strategy might be the cause of gender differences on achievement and attitude of students' in the subject at both teachers' made examinations and external examinations. Thus, this study is aimed to determine the mean achievement and attitude of male and female students taught Light waves concept in Physics using the Activity-Based Strategy in Senior Secondary School in Kagarko Local Government Area, Kaduna State.

## **Objectives of the study**

The main objectives of this study was to determine the Gender Differences on Achievement and Attitude of Physics Students in Senior Secondary School Kagarko Local Government, Kaduna State. The specific objectives are to;

- I. Determine the mean achievement scores between male and female students taught light waves concept using Activity–Based Strategy in senior secondary school in Kagarko local government area.
- II. Determine the mean attitude rating scores between male and female students taught light waves concept using Activity–Based Strategy in senior secondary school in Kagarko local government area.

## **Research Questions**

This following research questions guided the study:

What is the mean difference in achievement scores between male and female students taught light waves concepts using Activity–Based Strategy in senior secondary school in Kagarko local government area?

What is the mean difference in attitude rating scores between male and female students taught light waves concept using Activity–Based Strategy in senior secondary school in Kagarko local government area?

## **Hypotheses**

The following null hypotheses were raised and tested at 0.05 level of significance.

- H01: There is no significant difference in the mean achievement scores between male and female students taught light waves concepts using Activity-Based Strategy in senior secondary schools in Kagarko local government area.
- H02: There is no significant difference in mean attitude rating scores between male and female students taught light waves concepts using Activity-Based Strategy between male and female students in senior secondary schools in Kagarko local government area.

## **Methodology**

Quasi-experimental design was adopted for this research. The design enable comparison between males and females' students' treatments on participants in a pre-test and post-test design. This design was used to examine the gender difference on students' achievement and attitudes toward physics when they are taught physics using Activity–Based Strategy for experimental group. The treatment comprised only one group which were subjected to Activity–Based Strategy. Quasi-experimental design is best for this study because the sample is non-randomized which means intact class were used.

## **Population of the Study**

The target population of this study comprised of all the SS II Physics students in Public Senior Secondary Schools in Kagark Local Government Area of Kaduna state. There are twenty (20) public senior secondary schools in Kagark Local Government Area of



Kaduna State with a population of two thousand four hundred and thirty-one (2,431) SS II students categorized according to their sexes, male (1,143) and female (1,288) in Kagarko Local Government Area, (Kaduna State Annual School Census, 2020).

### ***Sample Size and Sampling Technique***

A sample size of forty-five (45) SS II Physics students formed the sample of the study; two (2) co-educational schools were selected using purposive sampling method. Simple random sampling method was used in selecting one (1) school from the two (2) sampled schools selected to represent experimental group by tossing a coin. One side of the coin was labeled GSS Kagarko and the other side was labeled GSS Jere, after the coin was tossed GSS Kagarko represent experimental group. The sample is represented in table 1 below:

**Table 1:** Sample of the Study

s/s	School	Group	Sample		Total
			Male	female	
1	GSS Kagarko	Experimental	26	19	45

### ***Instrumentation***

The instruments used before and after the commencement of teaching for students' attitude toward biology in experimental was adapted named as Physics Achievement Test (PAT), Physics Attitude Scale (PAS) and Lesson Plan.

### ***Validation of Instrument***

The instrument was subjected to both face and content validity. The validation of these instruments; Physics Achievement Test (PAT) and Physics Attitude Scale (PAS) was done by an expert in the Department of Science and Environmental Education, Faculty of Education, University of Abuja to check the face and content validity.

### ***Reliability of the Instrument***

The scores obtained from the trial testing were used to determine the internal consistency reliability co-efficient of the instruments. The internal consistency of PAT was determined using Kuder-Richardson formula (K-R 21), while the internal consistency reliability index of PAS was determined using Crombach Alpha.

Kuder-Richardson formular was used because the test item (PAT) were of multiple-choice types and were dichotomously scored. The internal consistency reliability coefficient of PAT was 0.82. The internal consistency of PAS was determined from the data collected, using Cronbach Alpha ( $\alpha$ ) was found to be 0.74.

### ***Data Collection Procedure***

Permission was sought and granted by the school authorities to use their school for the study. Thereafter, PAT and PAS were served to forty five (45) SSSII Physics students from the selected school. The results were then used to ascertain relative ability in achievement and attitude in Physics.

This period covered the treatment period which lasted for 6 weeks. The Physics students of the intact class of the male and female were taught using the Activity-Based Strategy. The topics were taught in the intact Physics class during the normal Physics period on the school timetable.



The post-test of PAT and PAS was administered to male and female Physics students at the end of the 8th week of the study.

### Method of Data Analysis

The data collected from the study were analyzed using frequency count, mean score, and standard deviation to answer research questions, while a t-test statistic at 0.05 level of significance was used to analyze data for testing the null hypotheses. the analysis was computer-based, with the use of the Statistical Package for Social Science (SPSS).

## Results

### Demographic Data

The characteristic of the subjects that constituted the sample in respect of gender were presented in table 2 below:

**Table 2:** Distribution of Sample According to Gender

Gender	No. of Students	Percentage
Male	26	57.8
Female	19	42.2
<b>Total</b>	<b>45</b>	<b>100</b>

Table 2 indicates the distribution of students who participated in the study according to gender. Further analysis reveals that out of forty-five students, twenty-six students representing 57.8% were male students while nineteen students representing 42.2% were female students. It then means that majority of students in the entire sample are male.

The following research questions were posed and answered as follows:

**Research Question 1:** What is the mean difference in achievement scores between male and female students taught light waves concepts using Activity–Based Strategy in senior secondary school in Kagarko local government area?

**Table 3:** Mean Achievement Scores of male and female students in the Experimental Group of Pre-test and Post-test (PAT)

Gender		Pre-test	Post-test	Mean Gain
Male	Mean	24.70	34.55	9.95
	Std. Deviation	0.86	0.79	
	N	26	26	
Female	Mean	24.88	36.62	11.74
	Std. Deviation	0.89	0.91	
	N	19	19	
Mean difference				1.79

The result in table 2 shows the mean achievement scores of male and female students in the experimental group. From the table, it was observed that the mean achievement scores of the male students in the experimental Pre-PAT was 24.70 with a standard deviation of 0.86, while that of female counterparts was 24.88 with a standard deviation of 0.89. This shows that, at the beginning of the study, the male and female students were almost at the same level in their knowledge of Physics. The male mean achievement scores for Post-

PAT was 34.55 with a standard deviation of 0.79, while that of their female counterparts is 36.62 with a standard deviation of 0.91. The result revealed that the female students exposed to Activity-Based Strategy had a positive effect on their achievement in Physics than their male counterparts exposed to Activity-Based Strategy. The difference in the mean gain achievement of male and female students in the group is 1.79 in favor of the female students.

**Research Question 2:** What is the mean difference in attitude rating scores between male and female students taught light waves concept using Activity-Based Strategy in senior secondary school in Kagarko local government area?

**Table 4:** Mean Scores and Standard Deviation on Attitude of Experimental Groups Due to Gender Pre-test and Post-test (PAS)

Gender		Pre-test	Post-test	Mean Gain
Male	Mean	1.46	2.67	1.21
	Std. Deviation	0.06	0.07	
	N	26	26	
Female	Mean	1.50	2.83	1.33
	Std. Deviation	0.09	0.08	
	N	19	19	
Mean difference				0.12

Table 4, shows the mean achievement attitude rating scores of male and female students taught with Activity-Based Strategy. From the table, it could be observed that the mean achievement attitude rating scores of the male students in the Pre-PAS was 1.46 with a standard deviation of 0.07 and that of their female counterparts was 1.50 with a standard deviation of 0.09. This implies that both male and female subjects for the study have nearly the same level of attitude toward Physics at the beginning of the study. The Post-PAS of male mean attitude rating was 2.67 with a standard deviation of 0.07, while that of their female counterparts was 2.83 with a standard deviation of 0.08. The difference in the mean gain attitude of male and female students is 0.12 in favor of the female.

### ***Test of Hypotheses***

The following null hypotheses were posed and answered as follows:

**H<sub>01</sub>:** There is no significant difference in the mean achievement scores between male and female students taught light waves concepts using Activity-Based Strategy in senior secondary school in Kagarko local government area.

**Table 5:** T-Test Mean Achievement Scores of Male and Female Students in the Experimental Group

Gender	N	X	SD	t-value	df	P (2-tailed)	Decision
Male	26	42.46	5.46	1.63	43	0.111	Accepted
Female	19	44.95	4.44				

From Table 5, it is observed that gender as a main effect is not a significant factor in students' achievement in Physics. The p-value is greater than 0.05 level of significance (p-value = 0.111 > 0.05). This is greater than the already set alpha value of 0.05 level of significance at 2 and 43 df (degrees of freedom). The implication of this is that the null

hypothesis of no significant difference in the mean achievement scores of male and female students is accepted. This means that the difference in the mean achievement scores of male and female students in the Pre-PAT and Post-PAT is not statistically significant.

**H0<sub>2</sub>:** There is no significant difference in mean attitude rating scores between male and female students taught light waves concepts using Activity-Based Strategy between male and female students in senior secondary school in Kagarko local government area.

**Table 6:** T-Test Mean Attitude Scores of Male and Female Students in the Experimental Group

Gender	N	X	SD	t-value	df	P (2-tailed)	Decision
Male	26	3.35	0.51	1.02	43	0.312	Accepted
Female	19	3.53	0.63				

From Table 6, it is observed that gender is not a significant factor in the attitude of students in Physics. The p-value is greater than 0.05 level of significance (p-value = 0.312 > 0.05). This is greater than the already set alpha value of 0.05 level of significance at 2 and 43 df (degrees of freedom). The implication of this is that the null hypothesis of no significant difference in the mean attitude rating of male and female students is accepted. This means that the mean attitude scores of male and female students in the Pre-PAS and Post-PAS, though not equal are not statistically significant.

## Discussion

The result shown in table 3, reveals that female students recorded higher mean achievement scores than the male, in the experimental Pre-PAT and Post-PAT. This mean difference was not statistically significant as revealed in the t-test statistic result in table 5. This implies that gender does not have a significant effect on students' achievement in Physics when exposed to Activity-Based Strategy. This finding contradicts Adam, Kime and Wali (2022) and Yakubu (2021) who study revealed that significant difference exists between the academic performance of male and female students in Physics in favour of male students. These findings agreed with Areo (2022) who found no significant influence of gender on students' achievement in Physics. This finding also lends support to other researchers such as, Ibrahim, Sabitu and Magaji (2016) revealed that there was no significant difference in performance of male and female students in Biology, Chemistry and Physics. It means that Activity-Based Strategy is gender-friendly; it can be used to reduce the problem of gender issues in science.

Table 4, revealed that female students have a higher mean attitude rating in the Pre-PAS and Post-PAS than their male counterparts. The mean difference is, however, not statistically significant as revealed in table 6, at 0.05 level of significance. This implies that the use of Activity-Based Strategy as instructional material helped both the female and male subjects to develop a positive attitude toward Physics. In other words, gender did not influence the Activity-Based Strategy approach in Physics. Use of Activity-Based Strategy is practical oriented. The finding of this study contradicts Brajraj, Rakhee, Rekha and Sigh (2019) who revealed that there is significance level of attitudinal differences toward science subjects between male and female students. The finding of this study is in line with Areo (2022) who discovered that attitude of students toward Physics was not

determined by gender. These findings also lend support to other studies such as Katcha and Wushishi (2015), Apochi, Umoru, and Onah (2018), who found that there is no significant difference in students' attitudes and interests based on gender when exposed to adequately equipped laboratory and advance organizer strategy. Also, Muchai's (2016) study showed that a practical approach leads to improved male and female students' attitudes toward Physics. The male and female students were exposed to the same method which give them equal opportunity to participate actively, this helped to boost their attitude irrespective of gender.

## **Conclusion**

Based on the result obtained, the researcher draws conclusion that the use of Activity-Based Strategy promoting gender achievement and attitude in Physics concepts. Gender had no significant influence over students' achievement and attitude in Physics. This implies that the relative superiority of Activity-Based Strategy in fostering achievement and attitude was uniform for both male and female students.

## **Recommendations**

The following recommendations are made based on the findings of this research:

- I. Physics teachers: Physics teachers should be encouraged to incorporate Activity-Based Strategy of teaching since the method provides equal opportunity for both male and female students' achievement and positive attitude toward Physics concepts.
- II. Government/education administrator: Government/education administrators should also organize public lectures, seminars, and workshops, incorporating of Science Teachers Association of Nigeria (STAN) on Activity-Based Strategy in schools, as a way of marketing the new concept;
- III. Government: Government should through appropriate agencies, sponsor further research into the possible application of Activity-Based Strategy in other aspects of science and technology.

## **References**

- Adam, M., Kime, M. M & Wali, H. M. (2022). Gender difference in performance in four science subjects in Borno State Colleges of Education. *Journal of Education and Practice*: [www.carijournals.org](http://www.carijournals.org) ISSN 2520-467X (Online);6 (4), 1 - 11.
- Achuonye, K. (2014). Predominant Teaching Strategies in Schools: Implication for Mathematics, Science, and Technology Curriculum Implementation. *Being a Paper Presented at the 14<sup>th</sup> Annual Conference of the Curriculum Organization of Nigeria, Calabar, University of Calabar.*
- Amedu, O. I. (2015). The Effect of Gender on the Achievement of Students in Biology using the Jigsaw Method. *Journal of Education and Practice*. [www.iiste.org](http://www.iiste.org), ISSN 2222-288X, 6(17), 176-180.
- Apochi, M. A., Umoru, S. E., & Onah, D. O. (2018). Effect of advance organizers on Senior Secondary Students' Interest in Biology in Makurdi Metropolis. *ATBU*,

*Journal of Science, Technology & Education (JOSTE)*; ISSN: 2277-001, 6(3), 18-26.

- Areo, O.O. (2022). Influence of gender on students' achievement and attitude towards physics in secondary schools in Ondo State, Nigeria. *International Journal of Research in Education and Sustainable Development*, www.ijaar.org | ISSN: 2782-7666; 6(2), 1-9.
- Brajraj S., Rakhee, C.1, Rekha, Y.& Singh, K. (2019). A study on gender difference in attitude towards science. *International Journal of Education (IJE)*, <http://iaeme.com/Home/issue/IJE?> 1(2), 38-46.
- Erdemir, N. (2009). The Change and Development of Attitude of Science Teacher Candidates towards Branches Kastamonu Education Journal, 17(1), 161-170.
- Fasakin, P. J. (2011). *Effects of Everyday Phenomena on Students' Achievement, Attitude, and Practical Skills in Physics*. A master's Dissertation Submitted to the Department of Teacher Education, University of Ibadan, Ibadan, Nigeria.
- Gin, E. K. (2011). Gender and Politics in Nigeria: Lessons and Challenges for the Nigerian Woman for the Actualization of Vision 20: 2020. *The Belt Journal of Education* 2(2), 67-96. <https://en.m.wikipedia.org/wiki/physics>. Retrieved 13<sup>th</sup> June, 2024.
- Ibrahim, S.T., Sabitu, A & Magaji, Y. M. (2016). Comparative analysis of gender performances in biology, chemistry and physics among pre-degree students of Federal University, Dutsinma. *International Journal of Educational Benchmark (Ijeb)*, eISSN: 2489-0170 pISSN:2489-4162 University of Uyo, 5(1), 108-118.
- Josiah, M. M. (2013). Effects of Practical Physics Knowledge on Students' Academic Achievement: A Study of Pankshin Local Government Area of Plateau State, Nigeria. *World Educators forum/Effects of Practical Physics Knowledge on Students' Academic.pdf*, <http://www.globalacademicgroup.com/journals/worldeducators>, 2(1), 1-9.
- Katcha, M. A., & Wushishi, D. I. (2015). Effects of laboratory equipment on secondary school students' performance and attitude change to biology learning in Federal Capital Territory, Abuja, Nigeria. *Journal of Education Research and Behavioral Sciences*, ISSN23158735, <http://www.apexjournal.org>. 4(9),250-256.
- Kola, A. (2013). Importance of Science Education to National Development. *Latin-American Journal Physics Education*, 1(7), 223-229.
- Muchai, A. N. (2016). *Effects of practical work on students' achievements in physics at secondary school level in Murang a East Sub-County, Kenya*. An Unpublished Ph.D. Thesis Kenyatta University Kenya.
- Omebe, C. A., & Akani O. (2015). Effect of instructional resources on student's achievement in physics and chemistry in secondary schools in Ebonyi State, Nigeria. *European Journal of Training and Development Studies,UK* [www.eajournals.org](http://www.eajournals.org). 2(2), 56-65

WAEC (2018): Senior Secondary Certificate Examination. Chief Examiners Report, Reports, Lagos office, Nigeria.

Yakubu, P. A. (2021). Gender and assessment of physics students' academic performance in senior secondary school SSIII (SS3) Olamaboro Local Government Area of Kogi State, Nigeria. *AJSTME*. ISSN: 2251-0141, 6(2); 1-9.

Zhaoyao, M. (2012). *Physics Education for the 21st Century: Avoiding a crisis physics education*, 37(1), 18- 24.



## RELATIONSHIP BETWEEN PROTECTION OF TEACHER RIGHTS TO FREEDOM FROM DISCRIMINATION AND MANAGERIAL EFFECTIVENESS IN STATE UNIVERSITIES IN NORTH WESTERN ZONE, NIGERIA

<sup>1\*</sup>Bello Musa & <sup>2</sup>Usman Maryam Gogo

<sup>1\*</sup>Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University, Sokoto  
Email: [bello.musa@ssu.edu.ng](mailto:bello.musa@ssu.edu.ng)

<sup>2</sup>Department of Educational Foundations,  
Fati Lami Institute for Legal and Administrative studies, Minna  
Email: [maryamgogousman@gmail.com](mailto:maryamgogousman@gmail.com)

---

### Abstract

*The study investigated the relationship between protection of teacher rights to freedom from discrimination and managerial effectiveness in State Universities in North Western Zone, Nigeria. The research design for this study is explanatory correlational design. The population for this study comprised all academic staff and their principal officers which amount to 2674 among the eight (8) State Universities within the Zone. The sample size selection of 333 out of 2,674 was based on Research Advisors, the researcher applied proportionate sampling to draw up the sample while random sampling was used in picking the respondents. The study used two set of questionnaires for data collections. One of the instrument was adapted from Manga, (2022), titled: Protection of Teacher Rights Questionnaire (PTRQ). The other instrument was Self-designed questionnaires titled: Managerial Effectiveness Questionnaire (MEQ). The questionnaires were validated by expert using content validity. The reliability of the instruments was obtained using test, re-test method and reliability indexes of 0.86, 0.75 were obtained respectively. The researcher employed descriptive and inferential statistics for data analysis. Mean score was used to answered the research questions with decision mean at 3.0 as moderate extent of agreement. Pearson Product Moment Correlation Co-efficient was used to test hypothesis. The study found that there is significant relationship between protection of teacher right to freedom from discrimination and managerial effectiveness in state universities North western zone, Nigeria. Therefore, the study recommended that University management establish an administrative atmosphere which will reject any form of discriminations.*

**Keywords:** Protection of Teacher Right to Freedom from Discrimination and; Managerial Effectiveness

### Introduction

The struggle for promotion and protection of human rights has become prominent issue of discussion globally after the formation of United Nations at the end of Second World War II in 1945. On December 10th, 1948 the General Assembly of the United Nations adopted and proclaimed the universal declaration of human rights whereas all human is treated

equal, which led the foundation of freedom of justice and peace in the world (Johnson, 2021). Teachers right to freedom from discrimination was among the fundamental rights of citizens enshrine by the 1999 constitution of the Federal Republic of Nigeria in chapter IV section 33-44, such values as right to life, dignity of the human person, personal liberty, fair hearing, privacy and family life, right to freedom of thought, conscience and religion, freedom of expression and press, right to peaceful assembly and association, right to freedom from discrimination, right to acquired and own property, and freedom of movement (Federal Republic of Nigeria, 1999).

The importance of protecting human rights as such are to provide maximum protection to these rights against the abuse of power by the state organs; to established institutions and agencies for promotion of living conditions of human beings and for the development of their personality; and at the same time to provide effective measures for obtaining redress in the event of violation of those rights (Jayakumar, 2007). All these rights were promoted and protected in Nigerian traditional societies. However, in the areas where sharia system was strongly established more especially in the Northern part of Nigeria like Sokoto, Kano, Katsina, Jigawa, Borno, Bauchi, Zamfara, Kebbi, some part of Kaduna, Adamawa, Ilorin among others the fundamental human rights were safeguarded and protected by the authorities concern especially after the jihad of 1804 which was led by the Sheikh Usmanu bin Fodiyo in this region known as Hausa Land (Lawal, 2015). Therefore, educational mangers are expected to explore different administrative strategies in protecting teachers' rights and give every teacher the opportunity to serve any public office without discrimination on grounds of religion, sex, tribe, place of origin, and other distinguishing characteristics (Achimugu, 2005).

The theoretical basis for this study is based on access to justice theory theoretical proposed by Okogbule, (2005) who stated that access to justice has the following principles:

- I. Implies access to social and distributive justice and;
- II. The extents to which one can have distributive justice in any system is largely determined by the level and effectiveness of social justice in the organization.

This is possible because without access to justice, it is impossible for any organization to enjoy and ensure the realization of any other right, whether educational, civil, political, religious, or economic. Therefore, access to justice proposed the application of "substantive and procedural mechanisms existing in any particular society designed to ensure that citizens have the opportunity of seeking redress for the violation of their legal rights within that legal system." The legal and institutional structures existing in an educational system may be such that bar the teachers from having access to justice, who are therefore unable to seek for the enforcement or protection of their basic rights. Fundamental human rights proposed that rights are lawful, societal, or ethnical principles of basic freedom or entitlement while rights are the basic normative rules about what is allowable to people or owed to people, based on some lawful system and social convention (Emeka 2020).

### **Review of Related Empirical Studies**

Based on the variables under study some of the related empirical studies were reviewed which include:

Manga (2022), conducted study on the assessment of managerial strategies for protection of right to life, dignity of human person, right to personal liberty and right to fair hearing in Universities in Kebbi State, Nigeria. A descriptive survey design was used for the study. The population of the study comprised of students, staff and management staff of the Kebbi State University of Science and Technology and Federal University Birnin Kebbi. Stratified, deliberate and simple random sampling techniques were used to select 300 participants out of the total population of 1, 450 from two Universities. A self-designed and validated instrument title: Managerial Strategies for Protection of Human Rights Questionnaire (MSPHRQ) was used to collect data. The five-point instrument with 31 items and four sections was pilot tested using test, re-test method using Pearson Product Moment Correlation Co-efficient which yielded correlation index of 0.86 at 0.5 level of significance. Simple frequencies, percentages and means rating were used to analyze the data. The study found that, the application of managerial strategies for protection of fundamental human rights in Universities in Kebbi State was rated as highly satisfactory although there were lapses that needed to be addressed. It was recommended that to protect lives, more emphasis should be given to security measures. To protect dignity of the human person, condition of service and human relations should be improved upon. Staff and students should be enlightened on their rights in case of illegal arrest and detention for protection of their personal liberty. Accused persons should be given adequate time and facilities to defend themselves.

This study is highly related to the current study because the focus area of the study is on the assessment of managerial strategies for protection of right to life, dignity of human person, liberty and fair hearing in Universities in Kebbi State, only while the current study intends to investigate the relationship among protection of teachers right to fair hearing, freedom from discrimination and managerial effectiveness in State Universities in North Western Zone, Nigeria and the populations of the two studies are difference in size the previous study focus on only one state while current study is intend to cover the whole State Universities in the North West, Nigeria.

Moreover, Ekundayo, and Kolawole (2013), conducted study on time management skills and administrative effectiveness of principals in Nigerian secondary schools. The descriptive survey design was used for the study. The population consisted of all the principals and teachers of secondary schools in Ondo, Ekiti and Osun states. The sample comprised of 200 principals and 600 teachers randomly selected from the three states. The data collected were analysed using frequency counts, simple percentage, mean and standard deviations. The study revealed that the time management skills as well as the level of administrative effectiveness of the principals were encouraging. However, the study revealed the factors that constitute impediments to the time management skills of the principals. These include the need to respond to emergency cases in the school, the need to respond to urgent calls from the ministry of education among others. The study further revealed the strategies that can be put in place for better time management among the principals. These include the need for the principals to identify their most consuming tasks and determine whether or not they have investing their time in the most important activities, and keeping a readily accessible record of their appointment and tasks among others. Based on the findings, it was recommended that the tempo of time management skills of the principals as well as their administrative effectiveness should be sustained while efforts should be directed towards avoiding those factors that constitute impediments to their time management skills.

This study is highly related to the current study because the focus on time management skills and administrative effectiveness of principals in Nigerian secondary schools in Ondo, Ekiti and Osun states, Nigeria while the current study intends to investigate the relationship among protection of teachers right to fair hearing, freedom from discrimination and managerial effectiveness in State Universities in North Western Zone, Nigeria and the populations of the two studies are difference the previous study focus on secondary education level while current study is focus on tertiary education level also the geographical location of the two studies is different.

### **Statement of the Problem**

The researcher observed that there is indigenization factor in university administration, especially, the state universities where only state indigenes are being appointed or elected into key positions in the administration of the university. However, special treatment is given to some of staff either because of their religion or being the state indigenes. However, there are several scholarly views (Amadi, 2020; Angwe, 2017; Wey-Amaewhule, 2018; Elochukwu, 2021; Ibingo, 2021; Johnson & Salau, 2019; Lawal, 2015). For example, one of the area where one can easily detect discrimination in the universities administration among the staff is awarding research grants provided by the bodies like Tertiary Education Trust Fund (Tetfund). Ogunode (2020) lamented that instead of awarding research grants based on merit, academic excellence, or the potential for significant contributions to knowledge. Some management of the universities engage in nepotism and favoritism. Therefore, this study intends to assess the relationship among the protection of teacher right to fair hearing, freedom from discrimination and managerial effectiveness in State Universities North Western Zone, Nigeria.

### **Objectives of the Study**

The objectives of this study include the following:

- I. To find out the extent of protection of teachers right to freedom from discrimination in state universities North Western Zone Nigeria.
- II. To find out the level of managerial effectiveness in state universities North Western Zone Nigeria.
- III. To find out the relationship between protection of teachers right to freedom from discrimination and managerial effectiveness in state universities North Western Zone Nigeria.

### **Research Questions**

This research hope to provide answer to the following research question:

- I. What is the extent of protection of teacher's right to freedom from discrimination in State Universities in North Western Zone, Nigeria?
- II. What is the level of managerial effectiveness in state universities North Western Zone Nigeria, Nigeria?

## **Research Hypotheses**

The following Hypotheses were tested:

H01. There is no significant relationship between protection of teacher's rights to freedom from discrimination and managerial effectiveness in State Universities in North Western Zone, Nigeria.

## **Methodology**

This study is explanatory correlational design. Explanatory design consists of a simple association or relation between or among the variables (Creswell, 2012). The population of this study comprises all the state universities which are eight (8) in the North Western Zone, Nigeria. There were 2,392 academic staff and 282 principal officers with different qualifications and ranks. This gives us 2,674 as the total population of the participants. Proportionate and random sampling techniques were used in selecting 333 participants out of 2,674 which was based on Research Advisor (2006) table for determining sample size.

To collect the data for this study two sets of questionnaires which one was adapted from Manga, (2022) titled: Protection of teacher rights questionnaire and Managerial Effectiveness Questionnaire (MEQ) which was self-designed questionnaire, were used to collect data for this study. The questionnaires were structured in such a way that it requested the participant to tick relevant option from the given five (5) point likert scale as Very High Extent 5 points; High Extent 4 points; Moderate Extent 3 points; Low Extent 2 points; and Very Low Extent 1 point. The instruments were validated (content and construct validity) by team of experts in Educational Management from Faculty of Education and Extension Services Usmanu Danfodiyo University, Sokoto. The reliability of the instruments was obtained through test and re-test method and reliability index 0.86, 0.75 were obtained respectively. The responses to the questionnaire were collected and processed. The researcher employed descriptive and inferential statistics to analyse the data. Mean score was used to answered the responses of the participants to the research questions with the decision mean at 3.0 indicating moderate extent of agreement. While any mean score below 3.0 was considered as low extent of agreement. Pearson Product Correlation Co-efficient was used to test hypothesis. The data were processed with the use of Statistical Package for Social Science (SPSS).

## **Data Presentation and Analysis**

The results are presented in tabular forms and interpreted using descriptive and inferential statistics. Mean scores were used in answering all research questions. In so doing, it is pertinent to note that the responses were graded as: Very High Extent 5 points; High Extent 4 points; Moderate Extent 3 points; Low Extent 2 points; and Very Low Extent 1 point, which were used in analysing all the responses. While inferential statistics was used in testing all null hypotheses of the study.

**Research Question One:** What is the extent of protection of teacher's right to freedom from discrimination in State Universities in North Western Zone, Nigeria?

The respondents' responses on the extent of protection of teachers' right to freedom from discrimination in state universities in North western zone Nigeria is presented in Table 1.



**Table 1:** Extent of Protection of Teacher’s Right to Freedom from Discrimination in State Universities in North Western Zone of Nigeria

S/N	Item Statement	Mean	Std. Dev	Rating	Decision
1	No staff is discriminated in the university because of the tribe, state of origin, sex and religion	3.60	0.62	ME	Satisfactory
2	No staff in the university shall be discriminated upon by virtue of their physical disability	4.97	1.19	HE	Satisfactory
3	No staff shall be given special right and privacy that are not given to other	2.48	1.08	LE	Unsatisfactory
4	All promotion of staff to be based on merit without sentiment	2.45	1.03	LE	Unsatisfactory
5	All offers of appointment to positions of authority shall be based on merit without any discrimination	2.41	0.52	LE	Unsatisfactory
6	All allocation of offices, hostels, staff quarters and distributing any other resources to staff and student shall be done without discrimination	3.20	0.79	ME	Satisfactory
7	All disciplinary measures against offending staff and student should be applied without discrimination in the university	3.40	0.75	ME	Satisfactory
	<b>Grand Mean</b>	<b>3.21</b>	<b>0.88</b>	<b>ME</b>	

**Source:** Field Work (2023)

N=333, Cut off Mean=3.00

The results from Table 1 revealed that the respondents agreed that there is moderate extent in the protection of teacher’s right to freedom from discrimination. This is evident by an affirmed response of item one, indicate moderate extent with 3.60. Item two of the table indicate high extent with 4.97. Item three, four, five of the table indicate low extent with 2.48, 2.45 and 2.41 respectively. Item six and seven indicate moderate extent with 3.20 and 3.40 respectively. This indicates that state Universities in North western zone of Nigeria to a moderate extent of protection the rights of teachers to freedom from discrimination.

**Research Question Two:** What is the level of managerial effectiveness in state universities North Western Zone Nigeria? The respondents’ responses on the level of effectiveness of school administrators in state universities in North Western zone Nigeria is presented in Table 2.

**Table 2:** Level of Effectiveness of School Administrators in State Universities in North Western Zone of Nigeria

S/N	Item Statement	Mean	Std.Dev	Rating	Decision
1	Management in my university have set goals for protection of teachers rights and enhancement of their productivity	2.48	0.85	LE	Unsatisfactory
2	Management has documented rules and regulations for protection of teachers rights and ensuring managerial effectiveness	3.83	1.40	ME	Satisfactory



3	Management set up disciplinary committee for maintaining law and order and good conduct	3.94	1.52	ME	Satisfactory
4	Management has Examination Monitoring Committee to ensure that teachers give quality supervision of students during examinations	3.89	0.57	ME	Satisfactory
5	Management clearly state the terms of reference to guide the action of individuals and various authority for protection of teachers rights	2.48	1.21	LE	Unsatisfactory
6	Management appoints a chairman for each committee to lead and direct the activity of each committee	3.98	1.33	ME	Satisfactory
7	All faculties, departments and units are pursue uniform goals of protecting teachers rights and ensure their managerial effectiveness	2.98	0.67	LE	Unsatisfactory
8	Management ensure that all faculties, departments operate with synergy toward identifying and addressing challenges on protection of teachers rights and ensuring teacher productivity	2.17	1.45	LE	Unsatisfactory
9	Management ensure that Deans, Directors, Head of Departments supervised the activities of committees and individuals towards protecting the rights of teachers and maintaining teacher productivity	3.40	1.76	ME	Satisfactory
10	Management ensure that Directors, Deans, Head of Departments motivate, guide, mentor and evaluate the activities of staff, committees and teachers towards enforcement of teachers rights and higher productivity	4.11	1.38	HE	Satisfactory
	<b>Grand Mean (<math>\bar{x}</math>)</b>	<b>3.32</b>	<b>1.14</b>	<b>ME</b>	<b>Satisfactory</b>

Source: Field Work (2023)

N=333, Cut off Mean=3.00

Table 2 reveals that the respondents indicated strong confirmation that there is moderate extent in the level of effectiveness of school administrators. This is evident by an affirmed response of item one of the table indicated that low extent with 2.48. The item two, three and four of the table indicated the moderate extent with 3.83, 3.94 and 3.89, respectively. The item five of the table shows 2.48 mean score which is low extent. Item six indicated 3.98 which is moderate extent. Item seven and eight indicated low extents with 2.98 and 2.17 respectively. While item nine of the table shows the mean score of 3.40 which is moderate extent. Item ten of the table indicated 4.11 which is high extent.

### Hypotheses Testing

Three null hypotheses formulated were tested below:

H01: There is no significant relationship between the extent of protection of teacher's right from discrimination and managerial effectiveness in State Universities in North Western Zone, Nigeria.

This hypothesis was tested by subjecting protection of teacher's rights to freedom from discrimination and managerial effectiveness scores to a Pearson r-test analysis as shown in Table 3.

**Table 3:** Relationship between Protection of Teacher’s Rights to Freedom from Discrimination and Managerial Effectiveness.

Variables	N	Mean	Std. Deviation	r-Cal	p-Value	Decision
Freedom from Discrimination	333	32.04	11.687	0.192	0.000	Hypothesis Rejected
Managerial Effectiveness	333	73.68	11.724			

Source: Field Work (2023)

From the result of Table 3, teacher’s rights to freedom from discrimination and managerial effectiveness were positively related and significant,  $r(331) = 0.192$ ,  $p = 0.000$ . This indicates significant relationship between teacher’s rights to freedom from discrimination and managerial effectiveness because the p-value is less than the 0.05 level of significance. Therefore,  $H_0$  which states that there is no significant relationship between teacher’s rights to freedom from discrimination and managerial effectiveness was rejected. The study discovers that protection of teachers’ right to freedom from discrimination is an indication of managerial effectiveness in State Universities in North Western Zone, Nigeria.

### ***Summary of the Findings***

Based on the research findings, the following findings are summarized:

- I. The study found that protection of teachers’ right to freedom from discrimination is an indication of managerial effectiveness in State Universities in North Western Zone.
- II. The study revealed that the level of managerial effectiveness was at moderate extent in state universities North Western zone, Nigeria.
- III. The study found that there is significant relationship between protection of teachers’ right to freedom from discrimination and managerial effectiveness in State Universities in North Western Zone, Nigeria.

### **Discussion**

This section intends to discuss the findings of this study in relation to the findings of previous studies one after the other as follows:

The first findings revealed that protection of teachers’ right to freedom from discrimination is an indication of managerial effectiveness in State Universities in North Western Zone, Nigeria. This has been explained by the responses of the respondents in table 2 item one, two, six and seven which indicate satisfactory. Therefore, for the benefit of every organization the management have to do away with any form of discrimination in their administration practice. This will help and make their subordinate to feel as a family and also put their best in achieving the organizational goals. Item three, four and five of table 2 indicate unsatisfactory.

The second finding revealed that the level of managerial effectiveness was at moderate extent in state universities North Western zone, Nigeria. Therefore, there is need for improvement on the side of the management so that the university goals could be achieve at higher level. This finding is in line with responses of the respondents in table 3 where

item two, three, four, six, nine and ten indicating satisfactory. The finding is in line with Chepkonga (2015) who discovered that managerial effectiveness plays a significant role in ensuring continued existence, development and adaptableness of organizations and that it is the major issue in the administration because every organization desires to achieve the target goals effectively and efficiently. Consequently, the finding agreed with Sonnentag, Volmer and Spsychala, (2010) who revealed that the level of performance of teaching staff and non-teaching staff could determine the performance of the university and it could also determine the level which the university target goals are achieved or accomplished.

The third finding revealed that there is significant relationship between protection of teacher right to freedom from discrimination and managerial effectiveness in State Universities North Western Zone, Nigeria. This finding is in line with Federal Republic of Nigeria Constitution of 1999 which was amended in 2018 which was reported in section 42. However, the finding agreed with Nwamaka, (2009) who reported that discrimination may be in different form for example when a person is treated less favourably than another person in a the same or similar situations because of a particular personal characteristic such as their age, sex, race, religion, nationality, tribe, regionalism, economic status among others. Moreover, the finding is supported by Queiroz, (2017) who revealed that, aside for the strong possibility that women may be discriminated against in the course of their employment, discrimination at the point of selection is more difficult to establish and redress. Consequently, the finding is also agreed with Ogunkeye, (2018) who reported that certain policies can be adopted and put in place to ensure the equal treatment of all applicants' men and women in the job selection process. He argued that selection process must also be designed to be as objective as possible and objective yardsticks must attract a penalty.

## **Conclusion**

At times the important nature of right to freedom from discrimination and its inextricability from the personality of every human being must be respected in all societal organizations, which Nigerian Universities are included. Teachers' right to freedom from discrimination must be protected in order to ensure effective management of Nigerian universities. Protection of teachers' lawful rights can enhance the spirit of managerial effectiveness in the university system while the denial will have negative consequences on it.

## **Recommendations**

The study made the following recommendations which include:

- I. University management should demonstrate togetherness and brotherhood in their administration. This will make staff to feel more comfortable, more courageous and see themselves as a family.
- II. State Government through the Ministry for Higher Education should support the university management to use all the available mechanism in order to discharge their responsibilities effectively.

- III. Management of the universities should establish administrative atmosphere which will reject any form of discrimination, rejection, limitation or preference which is based on any ground such as race, tribe, Sex, language, age, religion, political or other opinion, nationality or social origin, property, birth or other status in their administration.

## References

- Achimugu, L. (2005). *The agonies of the Nigeria teacher*. Ibadan. Heinemann Educational Books (Nig) Plc.
- Amadi, D. K. (2020). The operational complexities of the “free exercise” and “adoption of religion” clause in the Nigerian constitution’
- Angwe, O. K. (2017). *School law*. London. West Publishing Com.
- Chepkonga, M. E. (2015). Issues and problems in the establishment of national judicial council under the 1999 constitution. *Calabar Law Journal.*, 3. (2) 101-112 (2015).
- Creswell, J. W. (2012). *Educational research: planning, conducting, evaluating quantitative and qualitative research*. Phoenix Color Corp.
- Ekundayo, H. T. & Kolawole, O. A. (2013). Time management skills and administrative effectiveness of principals in Nigerian secondary schools.: *Journal of Educational and Developmental Psychology*. 3. (1); 2013 ISSN 1927-0526 E-ISSN 1927-0534 URL: <http://dx.doi.org/10.5539/jedp.v3n1p133>
- Elochukwu, E. (2021). *Restoring the dignity and rights of the human person*. Retrieved on 22/2/2022 file:///C:/Users/USER/Desktop/Dignity/Restoring%20the%20Dignity%20
- Emeka, D. W. (2020). Democracy and freedom of religion in Nigeria: Towards a Global Etiquette. *Niger Delta Journal of Religious Studies*, 2. (1) Retrieved from: <https://www.researchgate.net/publication/349413668>
- Emmanuel, O. A. (2021). Observance of due process rights in capital offence trials: Assessing Nigeria through the lens of international instruments. *Journal of Law and Criminal Justice*. 9. (1) 36-51 ISSN: 2374-2674(Print), 2374-2682(Online). <http://doi.org/10.15640/jlcj.v9n1a4>
- Federal Republic of Nigeria (1999). *Constitution of the Federal Republic of Nigeria*, 1–196.  
Available at: [http://www.nigerialaw.org/ConstitutionOfTheFederalRepublicOfNigeria.htm/Chapter\\_2](http://www.nigerialaw.org/ConstitutionOfTheFederalRepublicOfNigeria.htm/Chapter_2)
- Fuller, L. L. (2009). *The morality of law*. London. Yale University Press.
- Hamilton, R. R. (2010). *The law of public education*. New York. The Foundation Press.

- Hornby A. S. (2015). *Oxford advanced learners dictionary of current English*. New York.
- Ibingo, I. E. (2021). Right to fair hearing in Nigeria under the imperatives of covid-19 Control. *NAUJILJ*. 12. (1) 57-68
- Jayakumar, S. (2007). Human rights education – the role of teachers. Paper presented in Western Regional Seminar held in H.J. College of Education, Khar (19,20, Feb. 2007)
- Johnson, I., & Salau, J. O. (2019). Human rights and governance in Nigeria, 2011-2015. *African Research Review*, 13. (1), 14-25.
- Johnson, U. O. (2021). The place of human rights in Nigeria’s democracy. *Ogirisi: A New Journal of African Studies*. 10. (3). 123-131. 2013
- Lawal, K. T. (2015). War against insurgency and abuse of fundamental rights to privacy and freedom of movement: Any justification? *Afro Asian Journal of Social Sciences*. 6. (4). 2229 – 5313. Quarter IV 2015.
- Manga, S. D. (2019). Assessment of causes and forms of insecurity in educational institutions in Kebbi State: Implication for school administration. *International Journal of Current Research*. 11. (10), 7676-7680 <https://doi.org/10.24941/ijer.36722.10.2019>
- Manga, S. D. (2022). Assessment of managerial strategies for protection of rights to life, dignity, liberty, and fair hearing in universities in Kebbi State, Nigeria: Implication to Educational Managers. *International Journal of Educational Research and Library Science*.
- Nwamaka, E. C. (2009). *Issues in Huamn Rights Guarantees*. Owerri: Hudson – Jude Press.
- Ogbu, O. N. (2021). The African charter on human and peoples’ right as compatible with despotism: The Nigerian Experience.
- Ogunkeye, O. (2018). “The legal remedies for copyright” in E.E. Uvieghara [ed], *Essays in Copyright Law and Administration in Nigeria*, Year Books, 1992, 110.
- Ogunode, N. J. (2020). Administration of public universities in Nigeria: Problems and Solutions. *Journal Sinesthesia*, 10. (2). 110-119.
- Okogbule, N. S. (2005). Access to justice and human rights protection in Nigeria: Problems and Prospects, *International journal on human rights*, 5. (3), 95-113.
- Queiroz, R. (2017). *Individual liberty and the importance of the concept of the people*. Palgrave Communications <http://dx.doi.org/10.1057/s41599-018-0151-3>
- Research Advisor, (2006). *Table of population sample*.

---

Sonnentag, S. Volmer, J. and Spychala, A. (2010). *Job performance*. Sage Handbook of Organizational Behaviour. 1 (ed.) Los Angeles, SAGE pp.

Wey-Amaewhule, B. (2018). The right to freedom of expression in Nigeria. *Auxano Law Journal*. 1 (5). 80 -108 Retrieved from: <https://www.researchgate.net/publication>



## **PROFESSIONAL DEVELOPMENT AND ETHICS FOR ADULT EDUCATORS: REBUILDING TRUST IN ADULT EDUCATION PRACTICE**

**Emmanuel Tayo Daramola**

University of Ilesa, Ilesa, Nigeria

Email: [emmtayo@gmail.com](mailto:emmtayo@gmail.com)

---

### **Abstract**

*Professional development is the strategy use to strengthen practice in any careers, it also use to apply new knowledge and skills that will improve performance on the job. Ethics serve as a basic foundation for responsible practice in any field with a strong service orientation, it serve as guideline for individual collective responsibility in response to societal need for competent, accountable practitioners, enhancing credibility for a field of practice by functioning as a means of self-regulation. This paper, therefore, highlight ethical issue and its relationship with adult education profession and need for professional development in adult education practice. It was concluded that professional ethics are an integral part of adult education profession and to rebuild the profession to be relevant in this 21st century, scholars in the field of the adult education need to develop a greater awareness and sensitivity to ethical issues.*

**Keywords:** Adult Educator, Professional Development, Ethics, Rebranding

### **Introduction**

Over time, there has been considerable discussion and general agreement about what defines the core values of the field and what provides guidance for what professionals should do when they encounter conflicting obligations or responsibilities in their work or what it means to be an ethical, what does it mean to be an ethical instructor? As ongoing professional development becomes established, it can be beneficial to think critically about what it means to be an ethical educator of adult education practice.

An adult educator or instructor may know the topic and use appropriate adult learning strategies without being an ethical educator in the field. It is entirely possible to follow the rules of teaching and adult learning without an understanding of the ethical considerations behind the rules. A basic tenet found in the field of research, the “fundamental ethical imperative behind the rules is that researchers [and teachers] seek to do their jobs in a manner that will not cause unjustified harm to anyone” (UM, 2002). Literature in the field is increasingly reflecting awareness of and discussion about the variety of professional development and ethical issue that arise from broadly diverse practice of adult education. This increasing focus and recognition of professional development and ethics are not limited to the field of adult education. The importance of this consideration in both personal and professional behavior has clearly become a current and relevant discourse in this 21st Century.

## **Current Position of Adult Education Practice in Nigeria**

Adult education in Nigeria has evolved significantly over the past few decades. Originally aimed at providing basic literacy skills, the scope of adult education has expanded to include vocational training, life skills, and continuing professional development. Historically, Adult education in Nigeria began as a colonial initiative aimed at educating the indigenous population to support colonial administration and economic activities. Post-independence, the focus shifted towards national development, with adult education seen as a tool for eradicating illiteracy and fostering socio-economic growth.

Currently, National Commission for Mass Literacy, Adult and Non-Formal Education (NMEC) is the primary body overseeing adult education in Nigeria. NMEC's mandate includes developing policies, coordinating programs, and ensuring quality standards in adult education across the country. The key components of Adult Education in Nigeria includes literacy programme, vocational training, continuing professional development programme, health education, civic education, financial literacy, community development, women empowerment programme among other.

Adult education plays vital roles in development of a nation particularly, Nigeria. The roles includes;

- I. **Lifelong Learning:** In an era where continuous learning is essential, adults expect education systems to provide opportunities for lifelong learning. This includes upskilling, reskilling, and gaining new competencies to remain relevant in a rapidly changing job market.
- II. **Economic Empowerment:** Many adults look to education as a pathway to better job opportunities and economic stability. They expect adult education programs to offer practical and vocational training that can directly improve their employability and earning potential.
- III. **Personal Development:** Beyond professional benefits, individuals seek personal growth through education. They expect adult education to enrich their lives, enhance their critical thinking, and provide a deeper understanding of the world.
- IV. **Social Inclusion:** Education is seen as a tool for social integration and cohesion. People expect adult education to bridge gaps created by socioeconomic disparities, providing marginalized groups with the skills and knowledge to participate fully in society.

As Adult education been recognized as a critical component in fostering personal growth, social development, and economic progress. As societies evolve and the demands of the modern world shift, the expectations placed on adult education practices continue to grow. The people expectations are as follows;

- I. **Accessibility and Flexibility:** Adults need educational opportunities that fit into their busy lives. This means flexible scheduling, online and blended learning options, and local access points. Programs should be designed to accommodate the diverse circumstances of adult learners, including those with jobs, families, and other commitments.

- II. **Quality and Relevance:** High-quality education is paramount. Learners expect well-structured programs with qualified instructors who can provide relevant, up-to-date information and skills. Curricula should be aligned with current industry standards and societal needs.
- III. **Recognition and Certification:** Adults expect that the education they receive will be recognized and valued by employers and educational institutions. This includes the expectation of earning certificates or qualifications that can be easily translated into career advancement or further educational opportunities.
- IV. **Support Services:** Effective adult education programs should offer support services such as career counseling, mentorship, and financial aid. These services help learners navigate their educational journey and maximize their chances of success.
- V. **Community and Networking Opportunities:** Many adult learners value the chance to connect with peers, build networks, and participate in a learning community. Education programs should facilitate these opportunities, fostering a sense of belonging and mutual support among participants.

Despite the progress, adult education in Nigeria faces numerous challenges. The challenges includes;

- I. **Funding and Resources:** Inadequate funding is a significant challenge. Many adult education programs are underfunded, leading to issues such as insufficient learning materials, poorly paid educators, and inadequate infrastructure.
- II. **Quality of Education:** Ensuring the quality of adult education is difficult due to a lack of standardized curricula and trained educators. Many programs rely on volunteer teachers, who may not have the necessary skills or training.
- III. **Access and Participation:** Despite efforts to expand access, many adults, especially in rural areas, are unable to participate in educational programs due to distance, cultural barriers, and socioeconomic factors.
- IV. **Technological Barriers:** The integration of technology in education has not been fully realized in adult education. Limited access to digital tools and the internet, particularly in rural areas, hampers the effectiveness of online learning initiatives.

### ***Ethical Issue and its Relationship with Adult Education Profession***

The issues of ethics have been impeded in adult education practice because of the field's diversity and the tendency focus only on its learner-centered nature rather than its practices. Recently professional in adult education practice begun to consider the role of ethics and its relationship to practice. In describing the importance of ethics to the field, Sork (1988) cited in ERIC Digest (2015) suggests that "a consideration of the ethics of practice is inescapable if anything approaching a complete understanding of practice is ever to be achieved". By its nature, the practice of adult education is an endeavor in which "ethical choices are not some abstract ideal but are embedded in the very fabric of practice". Because ethics is the process of deciding what should be done, the choices adult educators continually make such as what individuals are to learn or how programs are to be developed reflect the ethical nature of their practice (Cervero 1989). Many of adult

education practice are characterized by ambiguity and conflicting values which preventing adult educators from applying standardized principles as solution. Instead, educators begin to make choices that are based on their beliefs about the way things ought to be (Cervero, 1989).

In other to think about decision making relative to ethical issues in adult education profession, Brockett (1990), has proposed a model. The model describes a process that allows adult educators to draw upon their basic values in making practice decisions. Rather than providing prescriptive guidelines, the model helps people discover the best course of action for themselves, which is better than telling people what to do (Brown, 1990). The dimension of the model has three dimension, the first dimension is personal value system which helps adult educators answer questions on what do I believe and how committed am I to those beliefs. This reinforces the individual the fact that ethical practice begins with an understanding of personal value. Because of the nature of the adult profession, adult educators are responsible to the whole society ranging from learners in the class to the entire people in the society and as a result of this the second dimension of the model is consideration of multiple responsibilities which the question is around "To whom am i responsible as an adult educator?". This dimension adult educators to consider the options or choices available in meeting what are frequently conflicting needs. Adult educator professional is expected to have this in mind that a way of putting values into practice help to identify basic moral principles that lie at the heart of one's practice and the third dimension was based on this which is operationalization of values, asks "How do I put my values into practice?". Brockett (1990), suggesting the following six principles to guide practice:

Respect--Do I respect the learners with whom I work?

Justice--Is there equity in service to learners?

Obligations to clients--Are the rights and responsibilities of all parties involved shared and considered?

Beneficence--Are harmful outcomes minimized and positive outcomes maximized?

Caring--Do I really care about the learners with whom I work?

Self-awareness--Am I able and willing to reflect on my own adult education practice?

Ethical dilemmas are an inevitable part of adult education practice. Caffarella (1988), examines Brockett's model. According to her, personal value system, affects how individuals teach, what they teach, and how they interact with their students. The personal value systems facilitator in any adult class will influence whether they emphasize learners' strengths or inadequacies; whether they treat students equally regardless of race, gender, age, social class ethnic origin, or creed and previous learning experiences. Adult educator faced with this dilemma must decide whether to abandon, modify, or stay on course with the approach that is consistent with his/her personal view of human nature. She further points out that teaching adults is seldom a full-time occupation. Ethical dilemmas may occur when other responsibilities conflict with teaching or are given a higher priority than the teaching role. Any adult educator whose teaching role is secondary to other responsibilities may need to examine his motives for teaching adults as well as whether he can take time from his major roles to prepare adequately for teaching.

In addition, she suggests that adult educator also need to model ethical behavior in teaching. According to Caffarella, this practice "requires all participants in the learning activity, facilitator and learners alike, to be willing to question what is being taught and how the subject matter dis being addressed"

Brockett (1990), also suggests the following ideas for promoting ethical practice in adult education.

**Self-examination.** The starting point for understanding the ethics of practice is found in personal value systems but these must be articulated. Writing down and reflecting on one's personal philosophy of adult education is a helpful process for helping clarify personal beliefs.

**Reflect on ethics in practice.** Finding time for personal and group reflection on ethical issues is important because it helps uncover ethical dilemmas and resolve conflicts before they arise.

**Examine the practices of other professions.** Learning how other professions deal with ethical dilemmas can lead to more insights about the ethics of adult education practice. Although this approach may be helpful, Brockett warns against uncritical adoption of practices that are incompatible with adult education's philosophical approaches.

Adult Practitioners need to understand that some of their learners can be in a liminal space where they' are re-examining their conventional ethical and professional actions to reshape or re-build their actions to be more ethical and professional. Occasionally, they get lost in the liminal space because they get confused, frustrated, and emotional due to their transitional and transformative processes. (Misawa, 2022). So, adult practitioners can guide adult learners through the metamorphosis and transition from liminal spaces to the coming place or phase for a better understanding of ethics and professionalism. While adult practitioners and educators are creating similar surroundings, they also need to consider how they can produce and sustain safer and further regardful surroundings so that they and their learners are suitable to witness mutually developed and understood ideas about ethics and professionalism and practice ethical decision- making chops. In similar surroundings, adult educator professional need to be humane because they need to understand the vulnerability of their learners. When addressing ethics and professionalism in education and training for adult learners, adult education professional can use an ethics- centered practice. The ethics- centered practice can be enforced in a mutually regardful and humane literacy terrain to integrate critical tone- reflection, learners ' life gests , and an understanding of surrounds. When enforcing the ethics- centered practice, adult preceptors and interpreters also need to be apprehensive that they bring their own particular belief systems into the literacy space and that they can display their own actions that were shaped by their particular life gests into the literacy terrain (Misawa, 2017). So, it's important for adult education professional to have a clear description of ethics through critical tone-reflection and to gain mindfulness of how their value system could impact their tutoring. By establishing and maintaining an mindfulness of particular ethics and how these may impact tutoring and learning through the ethics-centered practice, adult preceptors and interpreters can more navigate conversations about ethics, ethical practice, and professionalism with adult learners without unconsciously impacting or investing particular beliefs into the discussion.



The ethics- centered practice is also an important element of educating grown-ups about ethics and professionalism at colorful situations including classrooms, institutions, and associations. As stated over, it has decreasingly come more delicate and grueling to educate ethics and ethical actions in professional settings due to putting value more on individual or micro position of different testaments on ethics and ethical actions than institutional and organizational or meso and macro situations of understanding of ethics and ethical actions( Hansman, 2020; Misawa, 2022). Presently, there isn't a lot of guidance available regarding clear ethical norms for interpreters of adult literacy and some in the field are also resistant to having a policy or sanctioned law of ethics. While a policy or law of ethics may be unrealistic in terms of accommodating such a different field of practice, having a companion for ethics and professionalism in the field could grease growth and invention. Ethical norms of practice within adult education could also serve as a foundation and grease the tutoring of ethics and professionalism in the classroom to our adult learners.

Encourage and support a research agenda on ethics. Research can lead to greater understanding of ethical issues in adult education and provide information that will help adult educators respond to them.

### ***Need for Professional Development in Adult Education Practice***

Professional development refers to many types of educational experiences related to an individual's work. Doctors, lawyers, educators, accountants, engineers, and people in a wide variety of professions and businesses participate in professional development to learn and apply new knowledge and skills that will improve their performance on the job. Many fields require members to participate in ongoing learning approved by the profession, sometimes as a requirement for keeping their jobs. Professionals often also voluntarily seek new learning. In education, research has shown that teaching quality and school leadership are the most important factors in raising student achievement. For teachers to be as effective as possible, they continually expand their knowledge and skills to implement the best educational practices. Educators learn to help students learn at the highest levels. Professional Development is critical for maintaining continuous improvement in quality of adult education profession and also help to increase availability and volume of information arise with regard to best practice of adult education.

There are a great number of theories about how and why adults learn. As with theories about how and why children learn, nearly all are based on either the behaviourist or cognitive approach from a psychological point of view. Stein, McRobbie and Ginns (1999) identify some common themes underpinning several theories and models of adult learning principles, namely those of Shulman (1987), Hargreaves & Fullen (1992) and Guskey (1986). Most pointedly they refer to the need for existing beliefs and knowledge of learners to be considered, non-critical assistance with personal reflection, engagement in professional dialogue and a feeling of personal responsibility for learning. Teachers also need time and opportunities to test new ideas. This is a very humanistic approach to Professional Development. Burns cited in Paulia (2008) pointed out that adult learners come to any learning environment with personality traits and values and attitudes that all affect the learning that takes place. These values and attitudes affect the way the trainer is perceived by the learner and also the way in which the learner perceives the content. This point is supported by Sternberg's theory of thinking styles (cited in Paulia, 2008). He defines three different styles of "self-government". The legislative style, when planning and organising and creativity are more important than actually carrying out the plan, the



executive style, when following an established plan in a structured environment is important, and lastly the judicial style, when analysing and evaluating a plan is at the forefront of thought. Sternberg indicates that while all three styles function in most people, one will dominate. These three very different styles of thinking would certainly influence individual perceptions of any given situation. An example of such a difference springs to mind that occurred at a recent Professional Development day. The facilitator asked participants to compile a list of things they hated about such days. About half the group agreed that butchers paper exercises were boring and the other half agreed that these types of activities were useful and even fun. Another Professional Development day focused on spirituality and asked participants to share some defining moments in their life or career. Some participants found the stories inspiring and interesting, while others, once again, bored. (Paulia, 2008)

As a way of rebuilding adult education profession, it would be a benefit for adult educator to involve and participate in networking days for Professional Development. Reflection can be either personal or collaborative, with both kinds offering a different degree of benefit, and some recommend a combination of collaborative reflection and the use of narrative. In support of this, Gillentine's study cited in *Journal of early Childhood Teacher Education* (2006) considers the impacts of narrative and reflection, on teacher's "beliefs, values and practice, and sense of professionalism". He asserts that the study confirms that this is a valid method for Professional Development because the participants shared teaching knowledge and "validated participants as experts within the context of their own teaching". Attard and Armour (cited in *Physical Education & Sport Pedagogy*, 2004) presented similar findings. In their research, A case study of one teacher's early-career professional learning, they found that although the beginning teacher found the process of critical reflection difficult, he benefited "because it gave him a powerful sense of control over his professional learning and his professional life". Professional Development is also the key to any educational reform. Change can take place if Professional Development is relevant and systematic. Change and reform are inevitable with constantly developing ideas of what constitutes best practice in teaching and learning and societal changes. Information and computer technology in the classroom is a typical example. As little as twenty years ago many classrooms and in fact teachers did not use computers. Today that situation has changed radically. Computers are used in lesson preparation, lesson delivery, research and communication to name just a few applications. This type of paradigm shift demands a systemic approach to professional development for adult education profession.

The use of a critical friendship or mentorship is a powerful Professional Development strategy needed to rebuild adult education profession, this would allow to learn directly from more experienced colleagues that will provides opportunities for frank and confidential critical discussions, and fosters reflection and goal setting, and also enhances career guidance, and provides a unique opportunity to develop personal and professional relationships with colleagues. Koro-Ljungberg and Hayes (2006), agree that "mentoring is an important vehicle for immersing new members into a community of practice and ensuring their success". Experienced teachers have a wealth of knowledge to pass on to new teachers and also teachers that are experienced themselves but are new to any school. The role of mentor is multifaceted and must be so for successful induction of both new teachers and staff new to any school. A close relationship between an experienced teacher and a beginning teacher may assist in identifying the likelihood of beginning teacher

burnout. The rate of attrition is high among new teachers and is largely attributable to the pressures of the job. In equipping mentors with the necessary skills for mentoring this should be considered. What about teachers that need help and are not new to the profession? Apparently mentoring and reflection can be useful for these individuals too. (Paulia, 2008). Professional Development opportunities in adult education profession may take many forms, ranging from mentoring, induction, external study for higher qualifications, reflective studies of facilitated learning. Whatever the delivery method the major consideration should be how relevant the instruction to the building of the profession.

## **Conclusion**

The development of Adult education profession is a key function within adult education practice. It would help to develop into more effective practice in the field of adult education. Professional development is development of competence, and the acquiring of skills to improve performance. Adult educator professional need to be open to change and adapt andragogy teaching method appropriately so that they can adapt to the changing nature of environment and the learner's needs. There is rapid changing in teaching and learning with the emergence of own your device, E-learning, and other technology which are changing the approach to teaching and learning process. Professional ethics are an integral part of adult education profession and to rebuild the profession to be relevant in this 21st century, scholars in the field of the adult education need to develop a greater awareness and sensitivity to ethical issues.

## **Recommendation**

Based on the above discussion, this paper therefore recommends that;

- I. Using an ethics-centered approach to facilitation and practice in adult education practices should maintain the integrity of the profession as well increase learners' understanding of the integral role of ethics within daily life, professionalism, and future opportunities.
- II. Ethical standards of practice of adult education should be used as a foundation to facilitate the professionalism of adult education practices.
- III. Adult education as a profession, it is important to maintain professionalism and an ability to evaluate appropriate and inappropriate conduct.
- IV. There is need to encourage and support a research agenda on ethics. Research can lead to greater understanding of ethical issues in adult education and provide information that will help adult educators respond to them.
- V. Scholars in the field of the adult education need to develop a greater awareness and sensitivity to ethical issues.

## **References**

- Brockett, R. G. (1988). *Ethics and the Adult Educators: Ethical issues in adult education*. Brockett, R.G. (ed). New York: Teachers College Press.

- Brockett, R. G. (1990). Adult Education: Are We Doing It Ethically? *Journal of Adult Education* 19 (1) 5-12.
- Brown, M. T. (1990). *Working ethics*. San Francisco, Jossey-Bass.
- Caffarella, R. S. (1988). *Ethical dilemmas in the teaching of adults: ethical issues in adult education*. Brockett, R. G. (ed) New York, Teachers College Press.
- Cervero, R. M. (1989). *Becoming more effective in everyday practice: Fulfilling the promise of adult and continuing education new directions for continuing education*. Quigley, B. A. (ed) San Francisco: Jossey-Bass, Winter
- Ferrier-Kerr, Jenny; Keown, Paul; Hume, Anne. (2009). The Role of Professional Development and Learning in the Early Adoption of the New Zealand Curriculum by Schools. *Waikato Journal of Education*, 14, 123-137.
- Guskey, T. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.
- Hansman, C. A. (2020). Mentor concepts to further leadership development in adult education contexts. *New Directions for Adult and Continuing Education*, 167-168,
- Koro-Ljungberg and Hayes. S (2006) “The relational selves of female graduate students during academic mentoring: from dialogue to transformation. *Mentoring and Tutoring*. 14(4) 389-399.
- Misawa, M. (2022). Transformative learning as a passageway to social justice in higher education: An Asian American and Pacific Islander (AAPI) perspective on anti-bullyist practice in a North American Context. In A. Nicolaidis, S. Eschenbacher, P. T. Buergelt, Y. Gilpin-Jackson, M. Welch, & M. Misawa (Eds.), *The Palgrave handbook of learning for transformation* (pp. 571-589). Palgrave Macmillan.
- Misawa, M. (2017). Investigating technology usage and perceptions on cyber-mobbullying in higher education in the United States among college-age youth: A correlational study at a research institution. *Annali Online Della Didattica e Della Formazione Docente (International Journal)*, 9(13), 279-299.
- Paulina P. (2008). Professional development as a critical component of continuing teacher quality. *Australian Journal of Teacher Education*, 33(1). 37-45  
<http://dx.doi.org/10.14221/ajte.2008v33n1.3>
- Sork, T. J. (1988). *Ethical issues in program planning: ethical issues in adult education*, Brockett R. G. (ed) New York, Teachers College Press.

## PSYCHO-DEMOGRAPHIC FACTORS AND ATTITUDE TOWARDS E-LEARNING AMONG STUDENTS OF ADEYEMI FEDERAL UNIVERSITY OF EDUCATION, ONDO, NIGERIA

<sup>1\*</sup>Saheed Abiola Saka, <sup>2</sup>Akinyemi Olufunminiyi Akinbobola & <sup>3</sup>Adekemi Anthonia Olorunfemi

<sup>1\*</sup>University of Ibadan, Ibadan, Nigeria

Email: [ssaka055@gmail.com](mailto:ssaka055@gmail.com)

<sup>2&3</sup>Adeyemi Federal University of Education, Ondo, Nigeria

Email:

---

### Abstract

*Attitude towards e-learning has been subject of discussion among the educational stakeholders in Nigeria as it is known that adoption of electronic learning among Nigeria students is low. This study examined the correlate of self-efficacy, self-esteem, demographic factors and attitude towards e-learning among students of Adeyemi Federal University of Education (AFUED), Nigeria. This study adopted the correlational survey design. Samples of 147 students were selected through convenience sampling technique among students of AFUED, Ondo, Nigeria. The instrument comprised of self-esteem, self-efficacy and attitude towards e-learning scale. Pearson Product Moment Correlation and regression analysis were used to analyze the data. The result indicated a significant relationship between self-esteem and attitude towards e-learning  $\{r(147)= 0.398, p=0.01\}$  and self- efficacy and attitude towards e-learning  $\{r(147)= 0.329, p=0.01\}$ . It was further showed that, only age among demographic factors had a significant relationship with attitude towards e-learning. The study concluded that self-esteem, self-efficacy, and age had significantly relationship with attitude towards e-learning among students of AFUED. It is recommended that, the students the university should be encouraged and enlightened about the electronic and other mode of virtual learning.*

**Keywords:** Attitude towards e-learning, self-esteem, self- efficacy, age, the programme of study and mode of study

### Introduction

In our contemporary age, we inhabit a digital world where electronic processing and transactions have become integral to every facet of our lives. This digital age encompasses the widespread availability and utilization of modern tools for internet communication, smart devices, and other technological apparatus. This pervasive digital presence has a direct and indirect effect on improving the overall quality of life, simplifying various tasks for individuals. The emergence of the microcomputer in the 1970s marked a pivotal moment, initiating the pursuit of electronic learning at the school level (Palmer & Bray, 2001; Christensen, 2019). Since then, the utilization of electronic learning has experienced significant growth in developed countries, with this innovation extending to both tertiary and lower levels of education. This rapid integration has resulted in enhanced learning outcomes in these nations. However, the adoption of e-

learning in developing countries like Nigeria has been comparatively sluggish. A myriad of factors contribute to this, including the learners' unfavourable attitude towards e-learning and other challenges. Despite the global trend towards digital education, there are barriers facing the use of electronic learning in Nigeria.

E-learning refers to the accessibility of educational curricula and experiences through the utilization of electronic technologies. It is a commonly used term that denotes the modern methods of communication including use of computers and network, various audio-visual materials, search engines, electronic libraries and websites, whether accomplished in the classroom or at a distance (Bilal,2015). This approach is characterized by flexibility, utilizing technological tools to enable learners to study at their convenience, regardless of time or location. Educators are increasingly encouraged to embrace online teaching methods, ensuring that students can continue their learning journeys. This involves the intentional design of programs or courses to be conducted entirely online, facilitated through platforms such as Skype, Zoom, Google Meet, Webex, and Kahoot (Mohd, Rameli, Alhassora, Bunyamin & Hanri, 2020).

E-learning can be divided into two main categories: asynchronous, which includes video streaming, and synchronous encompasses virtual classrooms. Synchronous e-learning involves immediate interaction between learners and instructors, regardless of their disparate locations (Ogbona, Ibezim & Obi,2019). This form of e-learning encompasses real-time learning activities for remote learners, necessitating two-way communication between participants and the instructor. It can be conceptualized as a scheduled delivery of learning and may include video conferencing, multicasts, and virtual classrooms. On the other hand, asynchronous e-learning, in contrast to synchronous learning, does not occur in real time and does not require the immediate participation of learners and instructors. It is a self-paced learning process where students have more control over the learning process, including the timing and content ((Baba, Elfaddouli & Cheimanoff,2021).

However, asynchronous e-learning is more widespread, simpler to develop, and cost-effective compared to synchronous e-learning. It involves instructional activities, knowledge delivery, and the facilitation of student interaction, including the exchange and consideration of diverse viewpoints (Arkorful & Abaidoo, 2014). Educational institutions in developed countries have widely adopted e-learning, with both learners and instructors embracing the full utilization of virtual learning, especially during situations like the COVID-19 pandemic when face-to-face interactions were restricted. Some institutions have integrated electronic learning with traditional face-to-face methods. These approaches not only facilitate knowledge acquisition but also streamline the process of learning and transferring knowledge, making it more efficient than traditional learning methods (Akinbobola, 2015a).

In Nigeria, the emergence of the COVID-19 pandemic has reshaped the education delivery system. Numerous institutions, both public and private, are actively attempting to integrate electronic learning, but the uptake is sluggish. Some institutions face challenges in fully harnessing the benefits of e-learning, primarily due to factors such as the learners' attitudes, deficiencies in technological infrastructure, and other obstacles. There is a prevailing belief that Nigerian institutions are not adequately prepared to fully embrace e-learning options, with issues stemming from institutional and inadequate educational funding, including deficiencies in e-learning infrastructure such as poor internet



accessibility and a scarcity of functional computers in schools (Akinbobola, 2015a). Moreover, many institutions in Nigeria lack the financial capacity to provide ICT equipment for both teachers and learners. The affordability of basic ICT equipment, such as laptops, palmtops, and androids, is a significant challenge for most learners. Even those who can afford such equipment often face issues with the high cost of data required to access the internet. These combined factors hinder the country from fully capitalizing on the advantages of electronic learning. Furthermore, the attitudes of learners towards embracing electronic learning constitute another crucial factor affecting the widespread adoption of electronic and virtual learning in the country.

Attitude is a mental and emotional “hypothetical construct” which characterizes the human personality, a concept which cannot be observed directly, only inferred from people action.(Perloff, 2020). There are many studies that have been carried out on the attitude towards e- learning among tertiary students in developing countries (Izuchi & Opara,2021; Saka, Akinbobola & Saka ,2023; Odit-Dookhan, 2018; Edo (2016) Tabak & Nguyen, 2013; Harandi ,2015; Adewole-Odeshi ,2014; Sabah,2013 ; Obiamaka, Uchechucku & Chinwe (2011) while most of these studies were carried out among University students but this study investigated the attitude towards e-learning among the students pursuing National Certificate of Education (NCE) and degree in education as well as professional diploma in education (PDE) of Adeyemi Federal University of Education Ondo, Nigeria.

Adeyemi College of Education (now Adeyemi Federal University of Education) is the foremost teacher training institution in Nigeria. This institution has over nine thousand students and has a longstanding history of offering certificate programs in education, degree programs, and postgraduate diplomas in education in affiliation with Obafemi Awolowo University, Ile-Ife, Nigeria. It operated in this capacity for decades before attaining full university status on December 23, 2021. The college is recognized as a leading institution for teacher training in Nigeria, its educational innovations have had a significant impact on all levels of the Nigerian education system. Even as a pioneering institution in e-learning among Colleges of Education in Nigeria, the learners' attitudes towards e-learning still not inspiring.

The attitude towards e-learning among students may be influenced by underlying psychological and demographic factors. Psychological factors such as self-esteem and self-efficacy can impact attitudes toward electronic learning. Demographic factors like age, gender, mode of study, and program of study may also play a role in shaping attitudes toward e-learning among students of the institution. Self-esteem, as a psychological factor, determines how individuals feel about themselves, affecting their adoption of e-learning. For instance, a student with low self-esteem may feel comfortable using e-learning methods that involve minimal interaction with other learners. Research indicates that self-esteem and self-efficacy are linked to online learning among adult learners (Zhu, 2019).

Self-efficacy presents another factor that is likely to be correlated with attitudes toward e-learning. It stands as a fundamental principle of social learning theory and is defined as an individual's confidence in their ability to carry out behaviours required to achieve specific performance goals (Bandura, 1997). It also posited that students with high efficacy are more capable of exerting control over their behaviour and adapting to challenging situations. Higher efficacy is associated with a more positive attitude among students (Erdem, 2015). Beyond these psychological factors, various other demographic factors



have been identified as potential influences on the use of e-learning among tertiary institution students in Nigeria. It can be assumed that demographic factors such as age, mode of study, and program of study contribute to e-learning among students of the AFUED.

In terms of age and e-learning, there is a belief that age is often associated not only with a decline in cognitive abilities but also in motor learning. The relationship between age and e-learning is not firmly established, as different perspectives exist. Simonds and Brock (2014) noted that older students tended to show a greater preference for certain types of online learning, while younger students typically favoured more interactive learning techniques. Another demographic factor, the mode of study, may also be related to the adoption of e-learning. Part-time and distance learning students, for example, maybe more inclined to embrace electronic learning due to its flexibility, whereas regular or full-time students may prefer traditional modes of study, exhibiting lower interest in online and e-learning. Considering the issues outlined above, there is a necessity to undertake a study aimed at identifying the influence of psycho-demographic factors towards electronic learning among teacher trainees who play a direct role in imparting knowledge across various levels of the education system. Therefore, the study aims to explore the relationship of psycho-demographic factors and attitudes towards e-learning among students of the AFUED Ondo, Nigeria.

### **Objectives of the Study**

The purpose of this study was to examine the relationship between psycho-demographic factors such as self-esteem, self-efficacy, age, mode of study, program of study and attitude towards e-learning among students of Adeyemi University of Education, Ondo, Nigeria.

### **Hypotheses**

- I. There will be no significant relationship between self-esteem and attitudes towards e-learning
- II. There will be no significant relationship between students' self-efficacy and attitude towards e-learning
- III. There will be no significant relationship between demographic factors (age, mode of study and programme of study) and attitude towards e-learning

### **Research design**

This study adopted correlational survey design. The design was selected because the researchers only observed the relationships between the variables and did not manipulate the independent variables. Self-esteem, self-efficacy, age, mode of study and programme of study are the independent variables while dependent variable is attitude towards e-learning in the study.

### **Participants**

The sample consisted of 147 students of AFUED, Ondo, Nigeria with the use of convenience sampling technique. It is a non-probability sampling technique that involves the sample being drawn from the part of population that is close to hand. It is deduced

that, 17(11.6%) of total respondents are males and female respondents account for 130(88.4%) of total respondents. This indicates that a higher proportion of female students took part in the study than male students. In addition, respondents' age distribution shows that, 87(59.2%) of total respondents are below 20 years, 48(32.7%) are within 21-30 years, 5(3.4%) are within 31--40 years, while 7(4.8%) are within 41-50 years of age.

**Table 1:** Descriptive analysis showing frequency and percentage distribution of respondents' personal profile

Variable	Levels	Frequency	Percentage
<b>Age</b>	Below 20	87	59.2
	21-30	48	32.7
	31-40	5	3.4
	41-50	7	4.8
	Total	147	100.0
<b>Mode of study</b>	Regular	122	83.0
	Sandwich/Part-time	25	17.0
	Total	147	100.0
<b>Programme of study</b>	NCE Physics	35.	23.8
	History	25	17.0
	Degree Physics	20	13.6
	History	12	8.2
	G&C	20	13.6
	PDE	35	23.8
	Total	147	100.0

Source: Author's Field Survey (2022)

### **Measures**

A questionnaire was used to collect relevant data in this study. The questionnaire comprised of standardized scales with acceptable psychometric properties. The scales in the structured questionnaire were self-esteem, self-efficacy and attitude towards electronic learning. The questionnaire was in four sections: section A, B, C and D measuring demographic variables of the students, self-esteem, self-efficacy and attitude towards electronic learning.

**Socio-demographic Variables:** Section A of the questionnaire was used to assess the demographic characteristics of the participants which include age, mode of study and programme of study. Age was measured by asking the respondents to give their actual age. The participants were asked to indicate programme of study from these categories: Professional/Postgraduate Diploma in Education, Degree and NCE programmes. They were asked to indicate mode of the study that fall into: Regular and Sandwich/part-time.

The Self Esteem scale has 10 items. The scale was developed by Rosenberg in 1965. It was originally presented as a Guttman scale, but it is typically administered using a Likert-type response format, employing 4, 5, or 7 point scales ranging from Strongly Disagree to Strongly Agree. The Rosenberg Self-esteem scale has internal consistency of 0.77 and coefficient of reproducibility was at least 0.90 (Rosenberg, 1965). The scale is closely connected with the Coopersmith Self-Esteem Inventory. Keep scores on a continuous scale. Higher self-esteem is indicated by higher scores and vice versa.

The general self- efficacy scale is a 10-item which was originally developed by Jerusalem and Schwarzer in 1979 to measure emotion, optimism and self-belief to cope with a

variety of difficult demands in life. This is a self-report measure of self-efficacy. The total score is calculated by finding the sum of the entire items and it ranges between 10 and 40 with a higher score indicating more self-efficacy. The internal reliability is between .76 and .90.

Test of e-Learning Related Attitudes (TeLRA) scale is a 36-item scale developed by Kisanga and Ireson in 2016. TeLRA was adapted to measure the attitude towards e-learning among the students of higher tertiary institution. This scale developed to elicit teacher's attitude towards e-learning. Each item was scored on a 4 point response format, ranging from strongly agree to strongly disagree. The instrument has been shown to perform creditably well with reported Cronbach's alpha score of 0.857 (Kisanga & Ireson, 2016).

### ***Statistical Analysis***

Data collected in the study were subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS, version 22). In order to characterize the participants collectively and to summarize the data, descriptive and inferential statistics were employed, including frequency counts, percentages, table means, and standard deviations (SD). The Pearson Product Moment Correlation (PPMC) was employed to examine the relationship between attitude toward e-learning, self-efficacy, and self-esteem.

### ***Procedure for data administration***

The permission was requested and approval was given by the management of AFUED, Ondo, Nigeria. After the approval given, the researchers approached the lecture halls where they used to have general courses for both degree and NCE courses and the questionnaire were administered on the condition of anonymity after the researchers introduced themselves and the assistants. The researchers waited to collect the questionnaire while few of them did not return theirs. The questionnaire were administered in Obasanjo lecture hall, Ipaye lecture hall and three other halls in the school. 200 copies of the questionnaire were administered while 168 copies were returned and only 147 copies were good for analysis.

## **Results**

**Hypothesis One:** There will be no significant relationship between self-esteem and attitude toward e-learning among students of AFUED, Ondo.

A Pearson product moment correlation was employed to test the hypothesis at 0.05% level of significance. The respondents' self-esteem and their corresponding scores on attitude towards e-learning were subjected to test of relationship, the analysis result are summarised and presented in Table 2.

**Table 2:** Pearson correlation analysis showing the relationship between self-esteem and attitude towards e-learning of students of Adeyemi Federal University of Education

<i>Variables</i>	<i>N</i>	$\bar{X}$	<i>SD</i>	<i>Df</i>	<i>R</i>	<i>p-val</i>
<b>Self-esteem</b>	147	24.02	4.78			
				145	.398**	0.01
<b>Attitude towards e-learning</b>	147	79.28	10.51			

{r(147)= 0.398, p=0.01}

The Pearson correlation analysis based on Table 2 shows that, there is a significant relationship between self-esteem (N=147,  $\bar{X}$ =24.02, SD=4.78) and attitude towards e-learning (N=147,  $\bar{X}$ =79.28, SD=10.51), {r (147) = 0.398, p=0.01}. This suggests that, there is a significant positive relationship between self-esteem and attitude towards e-learning of students of AFUED. The null hypothesis which states that, there will be no significant relationship between self-esteem and attitude towards e-learning is therefore rejected.

**Hypothesis Two:** There will be no significant relationship between self –efficacy and attitude toward e-learning among students of AFUED.

A Pearson product moment correlation was employed to test the hypothesis at 0.05% level of significance. The respondents’ self- efficacy and their corresponding scores on attitude towards e-learning were subjected to test of relationship, the analysis result are summarised and presented in Table 3.

**Table 3:** Pearson correlation analysis showing the relationship between self -efficacy and attitude towards e-learning among students of AFUED

<i>Variables</i>	<i>N</i>	$\bar{X}$	<i>SD</i>	<i>Df</i>	<i>R</i>	<i>p-val</i>
<b>Self-efficacy</b>		30.20	6.67			
147				145	.329**	0.01
<b>Attitude towards e-learning</b>	147	79.28	10.51			

{r(147)= 0.329, p=0.01}

The Pearson correlation analysis based on Table 3 shows that, there is a significant relationship between self efficacy (N=147,  $\bar{X}$ =30.20, SD=6.67) and attitude towards e-learning (N=147,  $\bar{X}$ =79.28, SD=10.51), {r (147) = 0.329, p=0.01}. This suggests that, there is a significant positive relationship between self-efficacy and attitude towards e-learning among students of AFUED. The null hypothesis which states that, there will be no significant relationship between self efficacy and attitude towards e-learning is therefore rejected.

**Hypothesis Three:** There will be no significant relationship between socio-demographic factors ( age, mode of study and programme of study) and attitude towards e- learning among the students of AFUED.

**Table 4:** Summary of Pearson Correlation of socio-demographic factors and attitude towards e-learning (N= 147)

Variables	Mean	S.D	Age	Mode of study	Programme	Attitude
Age	1.53	0.77	1			
Mode of study	1.82	0.37	-.013	1		
Programme	2.17	0.78	-.206	.075	1	
Attit to e-learn	79.28	10.51	.172*	-.143	-.145	1

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

Table 4 presented the summary of correlation showing relationship between demographic factors and attitude towards e-learning. The result showed significant correlation between age and attitude towards e-learning ( $r = .172$ ). Also, the results showed no significant correlation between mode of study and attitude towards e-learning ( $r = .143$ ) and finally, the results showed no significant correlation between programme of study and attitude towards e-learning ( $r = .145$ ).

### Discussion

As the world undergoing digital transformation, the focus on attitude towards e-learning has become crucial, particularly in developing countries where its acceptance is poor. It is imperative to thoroughly examine the influence of psycho-demographic factors on attitudes towards e-learning.

The primary objective of this study is to ascertain the relationship between self-esteem and attitudes towards e-learning among students at AFUED in Ondo State, Nigeria. The findings indicate a significant positive correlation between self-esteem and attitudes towards e-learning among the students. This aligns with the conclusions drawn by Mohd Rameli, Alhassora, Bunyamin, and Hanri (2020), as well as Al-Obaydi, Doncheva, and Nashruddin (2021), who established a correlation between self-esteem and positive attitudes towards e-learning. Thus, high self-esteem is identified as vital psychological variable influencing positive attitudes towards e-learning, while low self-esteem tends to attract negative attitudes. Students with high self-esteem are more likely to embrace e-learning compared to their counterparts with low self-esteem.

The second objective of the study is to explore the relationship between self-efficacy and attitudes towards e-learning among students at AFUED in Ondo State, Nigeria. The findings reveal a significant positive correlation between self-efficacy and attitudes towards e-learning among these students. This finding is consistent with the research conducted by Bobou and Job (2021), who identified a statistically significant relationship between e-learning, self-efficacy scores, and e-learning readiness. Additionally, Yorganci (2017) demonstrated that students with a high level of efficacy exhibit positive attitudes towards mobile learning, and Yau and Leung (2018) found a positive relationship between self-efficacy and attitudes towards the use of technology in learning. This suggests that students with high self-efficacy are more likely to embrace e-learning and adapt easily to challenging situations, including the use of technology for learning.

The third objective is to assess the extent to which demographic factors (age, mode of study, and programme of study) are related to attitudes towards e-learning among students at AFUED, Ondo, Nigeria. The findings indicate that only age exhibits a significant relationship with attitudes towards e-learning among these students. This may

be attributed to the inclination of teenagers and adolescents towards online and social media, perceiving e-learning as a preferable means to explore the world compared to older students. The study also reveals that the programme of study and mode of study have no significant relationship with attitudes towards e-learning among AFUED students. This aligns with the findings of Jan and Mattoo (2018), who reported no significant mean differences among the three fields of research (Arts, Science, and Social Science).

## **Conclusion**

This study indicated that, self-esteem and self-efficacy related with the attitude towards e-learning while only age out of the demographic factors in this study related with attitude towards e-learning while others such as programme of study and mode of programme have no significance relationship with attitude towards e-learning.

## **Recommendations**

As a result of the outcome of the study, the following recommendations are made:

Nigerian schools should go beyond considering ICT infrastructure alone; It is essential to educate students about the benefits of the university embracing e-learning while the psychological factors of the students such as self-efficacy and self-esteem need to be put in consideration as well. The promotion of awareness regarding electronic learning should be intensified, particularly during orientation programs for new students and similar initiatives. School management should actively encourage students to embrace e-learning by organizing introductory courses, providing motivation, and engaging them in its usage. It is crucial to understand that electronic learning has come to stay, and the sooner we integrate it into our education system, the more advantageous it will be for students, institutions, and the country as a whole.

## **References**

- Adewole-Odeshi, E. (2014). Attitude of students towards e-learning in South-West Nigerian Universities: An application of technology acceptance model. *Library Philosophy and Practice (e-journal)*, 1035. <https://digitalcommons.unl.edu/libphilprac/1035>
- Akinbobola, A.O.(2015a). Enhancing transfer of knowledge in Physics through effective teaching strategies. *Information and Knowledge Management*, 5(6), 85-92.
- Akinbobola, A.O.(2015b). Evaluating science laboratory classroom learning environment in Osun state of Nigeria for national development. *Journal of Resources Development and Management*, 9,14-19.
- Al-Obaydi,L.H., Doncheva ,J., & Nashruddin,N.(2021). College students' self-esteem and Its correlation to their attitudes towards inclusive education
- Arkorful,V., & Abaidoo,N.(2014). The role of e-learning, the advantages and disadvantages of its adoption in higher education. *International journal of Education and Research*,2,397-410
- Baba, K., Elfaddouli,N., & Cheimanoff (2021). A Comparative Study of Synchronous and Asynchronous Learning during COVID-19 Crisis. 4th International Academic Conference on Education, Teaching and Learning. [www.iacetl.org](http://www.iacetl.org)



- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change, *Psychological Review*, 84(2). 191-215.
- Bandura, A.(1997). *Self-Efficacy: The exercise of control*, New York, NY. Worth Publishers,
- Bandura, A.& Adams,N.(1977). Analysis of self-efficacy theory of behavioural change, *Cognitive Therapy and Research*, 1(4). 287-310.
- Bilal,S.(2015). E-Learning Revolutionise Education: An Exploratory study. E-learning: A Boom or Curse. <http://www.researchgate.net/publication/280862765>
- Bubou,G., & Job, G.(2021). Investigated the individual innovativeness, self-efficacy and e-learning readiness of students of Yenagoa study centre of National Open University of Nigeria., <https://www.emerald.com/insight/2397-7604.htm>
- Christensen, D. (2019). The History of the Emergence of Technology in Education. <http://www.classcraft.com>.
- Eagly, A., & Chaiken, S. (2007). The advantages of an inclusive definition of attitude. *Social Cognition*, 25(5), 582-602.
- Edo, B.(2016). Attitude of academic staff towards e-learning in tertiary institutions in Rivers State. *International Journal of Education and Evaluation*, 2 (2) , 1-11
- Erdem, E.(2015). The relationship between self-efficacy and attitudes of chemistry teacher candidates. *Problems of education in the 21<sup>st</sup> Century*. 63, 62-70
- Harandi,S.(2015). Effects of e-learning on students' motivation. *Procedia Social and Behavioural Sciences* 181, 423-430
- Hollister,C.D.,Mehrotra,C.M., & McGahey,L.(2001). *Distance learning: Principles for effective design, delivery and implementation*, California, USA, SAGE Publications Incorporated.
- Izuchi,M.N., & Opara,I.M. (2021). Factors influencing e-learning in tertiary institutions in Rivers State. . *J Adv Educ Philos*, 5(3), 70-74
- Jan, H., & Mattoo,M.(2018). Attitude towards e-learning among research scholars with respect to the demographical variables. *Utopia of Global Education*, IV(I), 38-42
- Jerusalem,M., & Schwarzer,R.(1992).Self-efficacy as a resource factor in stress appraisal process.In R.Schwarzer(Ed.), *Self-efficacy: Thought control of action*.195-213
- Kisanga,D.H. (2016). Determinants of teachers' attitudes towards e-learning in Tanzanian higher learning institutions. *International Review of Research in Open and Distributed Learning*, 17(5)
- Kisanga, D.H.,& Ireson,G.(2016).Test of e-learning related attitudes (TeLRA) scale: Development, reliability and validity study. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 12(1), 20-36

- Mohd-Rameli,M., Alhassora,N., Bunyamin,M., & Hanri,C. (2020) Student teachers' attitude and self-esteem towards online learning: Application of rasch measurement model. *Universal Journal of Educational Research*, 8(11), 37-44
- Obiamaka,P.E.,Chinwe, R.O., Ikechukwu, C.& Josaphat,U. (2011). Gender perception and attitude towards e-learning: A case of business students, University of Nigeria
- Odit-Dookhan,K.(2018). Attitude towards e-learning: The case of Mauritian students in public Teis. *International Journal of Social sciences*, 4(3),628-643
- Ogbona,C.G., Ibezim, N.E. & Obi, C.A.(2019). Synchronous versus asynchronous e-learning in teaching word processing: An experimental approach. *South African Journal of Education*, 39(2), 1-15
- Palmer, S. R.,& Bray,S. L.(2001). Longitudinal study of computer usage in flexible engineering education. *Australian Journal of Educational Technology*, 17(3), 313-329.
- Perloff, R.M.(2020). *The Dynamic of Persuasion: Communication and Attitudes in the Twenty-First Century*. In: Lawrence Erlbaum Associates (Edu), Mahwah: New Jersey London
- Rosenberg, M.(1965). *Society and the adolescent self-image*. Princeton,NJ : Princeton University Press
- Sabah, N. M. (2013). Students' attitude and motivation towards e-learning. *Proceedings of the First International Conference on Applied Sciences Gaza-Palestine*.
- Saka, S.A., Akinbobola, A.O. & Saka, I.O.(2023). Computer self-efficacy, computer proficiency and gender as correlate of students' attitude towards e-learning in Adeyemi Federal University of Education, Ondo, Nigeria. *Journal of Curriculum and Instruction*, 14(1),213-222
- Simonds,T.A.,& Brock,B.L.,(2014). Relationship between age, experience, and students preference for types of learning activities in online courses. *Journal of Educators (online)*. 11(1)
- Tabak, F. & Nguyen, N. (2013). Technology acceptance and performance in online learning environments: Impact of self-regulation. *MERLOT Journal of Online Learning and Teaching* 9(1).
- Yau, K.H., & Leung,F.Y. (2018). The relationship between self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education. *Proceedings of the International multiconference of engineers and computer scientists*,2, 978-988
- Yoganchi, S.(2017).Investigating students' self-efficacy and attitudes towards the use of mobile learning. *Journal of Education and Practice*, 8(6), 181-185
- Zhu,C.(2019) Self-efficacy and self-esteem in online learning environments of adult learners. *International Journal of Learning Technology*, 13(4), 127-136

## IMPACTS OF ARTIFICIAL INTELLIGENCE-BASED TUTORING SYSTEM IN ENHANCING LEARNING EXPERIENCE AND PERFORMANCE

**Nuraddeen Malami**

Shehu Shagari University of Education, Sokoto

Email: [drnuraddeenmalami1983@gmail.com](mailto:drnuraddeenmalami1983@gmail.com)

---

### Abstract

*This paper attempted to describe the concept and impact of Artificial intelligence based tutoring systems in enhancing learning experience and performance. As the world advances in Science and Technology in the fourth industrial Revolution (4IR), the application of Artificial intelligence (AI) and Intelligent Tutoring System are finding their way into educational terrains. Intelligent Tutoring System have been described as the Industrial Model of 21st Century. This paper also discussed the origination of Artificial Intelligence from Computer Assisted Instruction (CAI) and origination of Artificial Intelligent Tutoring System (AITS) from Artificial Intelligence (AI). It also discussed the modules of ITS, impact of Artificial Intelligence System to both teachers and students, impacts of Intelligent Tutoring System in enhancing learning experience, predicted demands for intelligent tutoring system and relevant findings on impact of intelligence tutoring system on performance. These is aimed at creating more awareness and encouraging application of the system for enhancing learning experience and improvement of performance. It was recommended among others that teachers and students should be train on efficient and effective use of the system for teaching and learning in school.*

**Keywords:** AI- Artificial Intelligence, ITS- Intelligent Tutoring System, 4IR Fourth Industrial Revolution, CAI- Computer Assisted Instruction

### Introduction

Since the advent of the Covid-19 Pandemic, the landscape of education has change significantly in how instructional content are currently presented to students all over the world. While online education, online learning or e-learning is not new. However in view of the education lockdown initiated by the Covid-19 Pandemic, it has now become a norm. While the Covid-19 Pandemic lasts, it is very hard for teaching and learning to return to physical classes permanently. Meanwhile the need to present personalize instructional contents to students and also ensure that their learning needs are meet while the Pandemic lasts, with little efforts from teachers gave rise to extensive use of information and communication technologies (ICTs) in education these days. The majority of these ICT models of instruction general fall under what is collectively known as computer Assisted Instruction (CAI) Awolabi & Adetunbi, (2021).

The utilization of CAI in supplementing conventional instruction is not new. CAI is an automated instructional Strategy in which computers are used in presenting instructional contents to students through an interactive process. Also Eyo, (2018) stated that CAI is a form of instructional strategy in which computers with predefine instructions are use to present instructional contents to students CAI has also been define as self-learning

strategy in which computer programs that are either online or offline are used to facilitate and improve instruction. Some of the characteristics of CAI include prompt feedback to students, a multiple user approach, self-pacing instruction adaptability and random access facilities among others. As the world advances in the 21st century, there have been developments in CAI which have led to the designing of Intelligent Computer Assisted Instruction (ICAI). However, with the development of more sophisticated computer programmes for use in education, there is a current shift to a more sophisticated machine known as Artificial Intelligence (AI) which is now being applied in education as progress deepens in the fourth Industrial revolution. Although, there are continuous discoveries on the roles of AI in enhancing learning, this paper attempt to present some of its discovered and applied impacts. Also considering the fact that easier learning strategy has more impact on performance prompted the need for the paper to create more awareness and encourage the use of AI for enhancing learning and performance.

### ***Artificial Intelligence in Education***

Artificial Intelligence is one of the essential driven forces of the 21st century as it is rapidly transforming almost all human endeavours. In this wise it will be naïve to conclude that, the technology will not have an impact on education, given the fact that the possibility are profound because there have been mind having developments in the evolution of AI and the remarkable role it has played in human lives (Holmes, Bialik & Fadel, 2019). AI can sometime be hard to define, since it takes various forms and also because the phrase serves as an umbrella term for different procedures and technologies (Frankish & Ransey, 2014), given this, it is define based on four general approaches by Awolabi & Adetumbi (2021) as system that act humanly, system that think humanly, system that act rationally or system that think rationally, it Could therefore be deduced from this definition, that the main objectives of AI is to understand model and produce humanoid or ideal intelligent behavior in artificial systems whereby different techniques are used. AI is the ability of a computer controlled device to perform task in human like manner, the human like qualities include reasoning, meaning making, generalization and learning from past experiences all of which are examples of mental process. Some demonstrations of these mental process in AI based machines include of 2016 Google deep minds Alpha “GO” which defeated one of the world most accomplished “Go” players, lee Se-Dol, who is a South-Korean Champion (Say-Hon, 2016) as the greatest proof of AI’s human like thinking and skills, the result of this match shows that a true artificially intelligent system can learn on its own (Adams, 2017) as the world advance, the emergence and application of Artificial Intelligence in Education in particular has led to the application of a form of CAI, but in advanced form known as Intelligence Tutoring System (ITS). The Intelligent Tutoring Systems are Artificial Intelligence-based Computer programs that can imitate and perform the duties of human educator. As a form of Instructional Strategy in the 21st Century, Artificial Intelligence - based tutoring Systems are fact gaining ground as the world gradually transcends into the fourth Industrial Revolution (4IR).

Moreover, Albus, Vogt & Seuffer (2021), posits that students learn by active selection, organization, and integration of information from auditory and visual aids; thus, a combination of both words and pictures is more effective in promoting deeper learning than the use of words alone. With the help of animated pictures, it is easy to show things that would otherwise need many words to describe; images are also used to improve

remembering, learning and comprehension. These indicated the need for application of AI in education for easier learning and for better performance

### ***Artificial Intelligence-Based Tutoring Systems***

Artificial Intelligence-based tutoring Systems are Computer Systems or programs design to imitate human tutors. They are mostly referred to as Intelligent Tutoring System (ITS) the term intelligent Tutoring System was introduced and was first used in the research community to mean Intelligent Computer Aided Instruction (ICAI). According to Abidin & Baharin (2020) computer based Instruction Systems using artificial Intelligence methods is presenting students with opportunities for self-directed, individualized learning through intelligent guidance and help ITSs an extension of computer Aided Instruction (CAI) are educational software use for learning without the intervention of human tutors. It consist of intelligence, feedback and adaptive behavior (Reva, 2000). Earlier, Brown and Sleeman (1982) stated that ITSs are computer programs that provide instructions to students in a similar manner as human tutors while also providing feedback to students.

The necessity for time and location independent learning has portrayed ITSs as an important teaching and learning program allowing students to learn at their own pace and receive adaptive feedback on their learning progress. According to Cao, Yang, Laid and Wu (2021) the increasing reputation of ITSs portends that computer based instruction integrated with artificial intelligence prominent research areas. According to Karachi, Piri, Akyuz and Bilgici (2018), a typical ITS has three components which are (i) Domain model which is made up of instructional topics, examination questions and the relationship among the instructional topics and question (ii) students model which stores information about students learning history which importantly includes the topics students viewed, their login and logout times, their duration of learning in the system, the answer they provided to the questions asked by the system and their scores (iii) the teaching models which employs the information stored in the student model to provide students with intelligent guidance and help where needed.

Barana, Fissore and Machisio (2018) noted that the characteristics and degrees of intelligence of one ITSs to another vary extensively and generally the system score domain independent, meaning that the teaching model in different domains. On the other hand, Raza (2020) posits that ITSs are made up of four modules, the interface module, the student modules and the tutor module.

The interface module provide the route through which students interact with the system while the domain modules is concern with how instructional contents will be presented in the ITS. In other words, the domain module stores and represents problems, exercises and learning content of the domain. The students module is concern with students progress and achievement during the use of the system and measuring students learning and performance, giving guidance and providing feedback as well. The last module which is the tutor module involves the pedagogical strategies for effective teaching in the ITS. (Raza, 2020).

### ***Relevance Studies on Impact of Intelligence-Based Tutoring in Enhancing Performance***

According to Ernest (2015) as an up to date model of teaching, ITSs could be valuable supplementary aids to improving learning. Also the need to continuously improve



students achievement has been the focus of several studies for many years. He also reported that the need to improve students achievement created the need for researchers to develop novel methods of instruction and motivation. As students are motivated to learn, the more involved they get in the learning process therefore, the use of computer technologies is one strategy which when utilize will improve achievement and motivation in education. Moreover, Idirisu, et al, (2019) reported that students find tutoring system effective and helpful for learning.

### ***Impacts of Artificial Intelligence in Enhancing Learning Experiences***

Artificial Intelligence (AI) is revolutionizing various aspect of our lives including education. It reshape the way education is delivered and unlock new possibilities, among the impacts for teachers and students, google (retrieved on 22/2/2024) are.

- I. **Personalized Learning:-** Discuss how AI enables personalized learning experiences by adapting content, pacing and assessments to individual students needs. Explore the benefit of adaptive learning platforms that leverage AI algorithms to provide tailored instructions, allowing students to learn at their own pace and their specific areas of challenges or interest.
- II. **Data-Driven Insights:-** Examine how AI can analyse vast amounts of educational data to generate valuable insights. Discuss the benefits of using AI algorithms to identify patterns, trends and areas for improvement in students performance, curriculum design and instructional strategies. Explore how data-driven insights can inform decision-making processes and help-educators optimize learning experiences.
- III. **Enhanced Collaboration and Communication:-** Explore how AI powered tools and platforms facilitate collaboration and communication among students and educators. Discuss the impact of AI chat tools and virtual assistants that provide instant support, answer questions and guide students through their learning journeys. Highlight the benefits of AI powered platforms that enable seamless communication, allowing students and teachers to connect and collaborate regardless of geographical barriers.
- IV. **Intelligent content Creation:** Discuss the role of AI in content creation, such as generating educational resources, assessments and interactive materials. Explore the potential of AI to analyse existing content, identify knowledge gaps and generate personalized learning materials to meet the diverse needs of students. Highlight the advantages of AI powered content creation in terms of efficiency, accuracy and customization.

### ***Impacts of Artificial Intelligence-Based Tutoring System in Enhancing Learning Experience***

Some of the impact according to google (retrieved on 22/2/2024) are

- I. **Provision of Human like learning experience:** The system promote interaction as they utilize tutor that can collaborate with learners, engage in turn by turn conversations and adapt of discussions. Human teachers and learners a like have found AI tutors to be much more engaging and interactive.



- II. Provision of Personalized Feedback: The system give relevant feedback in a way that motivate learners individually, monitor the relationship between students emotion and learning as well as encourage students when needed. This help student learns as they will be given feedback based on their learning styles, speed and needs.
- III. Hosting Multimedia Learning: A part from providing personalized feedback, Artificial Intelligent Tutoring System Offer Variety of learning mediums while most online learning systems offer text and vedios, Intelligent tutoring systems offer text multimedia, simulation and even games. By delivering information this way, Artificial Intelligent tutors can provide information in a format that best suits the learner.
- IV. Encouraging Self-Paced Learning: Unlike human teachers, AI tutors can keep close tabs on every single student, this mean that, their emotions, progress and style of learning will always be taken into consideration during interactions. The tutor can also track students progress and give timely feedback, so that students know where they stand in terms of understanding and applying the materials.
- V. Constant Development to better Serve Learners: Usually, human teachers only teach one way of solving problems. Artificial Intelligence tutors can develop difference method of solving problems.
- VI. Ethical Considerations: This involves the importance of transparency, privacy and security when implementing AI powered educational system. It explored the need for responsible AI development and the role of educators, policy makers and stakeholders in ensuring ethical practices in Artificial Intelligence Implementation.

### ***Some Predicted Demands for Artificial Intelligence.***

The demands for artificial intelligence is predicted to increase between 2023-2027 by 48% with the rise of technologies in AI its applications in education have grown, with existing potentials for personalizing learning dynamic evaluations and significant engagement in online wireless and hybrid learning environments (Maghsudi, et al, 2021). More importantly, following the lecturers shortage, experts have advocated for some teaching responsibilities to be replaced by artificial intelligence-assisted robots.

According to Global Industry Insights Inc, the artificial intelligent education sector will be approximately \$20 billion in market shares by 2027 (Marinsek, et al., 2023). The industry's rise is encouraging as AI has the potential to relieve teachers' work loads across the world. Moreover according to World Economic Forum (WEF), a high percentage of business world will in cooperate technology like machine by 2025 (Leddy & Maccreanor, 2023).

### **Conclusion**

The paper concluded that, considering the need for more effective methods of teaching that are less time and cost challenging, intelligent tutoring system can be use to address the need. By harnessing the power of AI, there can be creation of more engaging, adaptive and effective learning environment that prepares students for the challenges of futures. The impacts stated and discussed are expected to go along way in enhancing

awareness and encourage application of the strategies for a easy learning and improvement of performance.

### **Recommendations**

The following recommendations were made considering the impact of the system

- I. There should be massive design, development and implementation of artificial intelligent based tutoring system because of its potentiality in enhancing learning and performance.
- II. Education Stakeholders should empower programmers and software developers to go into mass production of the system on various subjects for use in schools.
- III. Teachers and students should be train on efficient and effective use of the system for teaching and learning in school.

### **References**

- Abidin, J. I. Z & Baharin, H. E. (2017). Nation Malaysia: Closing the socio-economic educational achievement gap through free online tutoring vedios. In *International Visual Information's Conference*. Cham Springer, pp 521-530.
- Adams, R. L (2017). 10 powerful examples of artificial intelligence in use today. Forbes retrieved from <https://www.forbes.com/ssites/robertadams/2017>
- Adekunle, S. E. (2016). Perception of Secondary Schools Students on computer education in Federal Capital Territory (Abuja), Nigeria. *International Journal of Social behavioural Education, Economic, Business and Industrial Engineering* 10(1), 2016.
- Albus, P., Vogt, A., & Seufer, T. (2021) signaling in virtual reality influences learning outcomes and cognitive load. *Computers & Education*, 166, 104154.
- Awolabi, P & Adetunbi, L. (2021). Artificial Intelligence-Based Tutoring Systems Utilization for learning. *Unizik Journal of Educational Research and Policy Studies*. Vol.9, p16-28.
- Barana, A., Fissore, C. & Marchisio, M. (2018). Online tutoring to enhance University Success in European Distance and E-learning Network 2018 Annual Conference. European Distance and E-learning network 2018. Pp755-783.
- Cao, J., Shang, Y. & Mok, Q. (2019). The impact of personal innovations on the intention to use cloud classroom. An empirical study in China. *International Conference on technology in education*. Singapore. Springer pp179-188.
- Earnest, T. (2015). The Impact of Computer Aided Instruction on Students Achievement. Education thesis Dissertation and project. P. 177.

- Edutech202, (2017). Computer-Assisted Instruction. Retrieved from <http://edutech.202.blogspot.com>.
- Eyo, U.E (2018). Effect of computer-Assisted multimedia instruction on senior secondary School Students achievement in Biology in two educational zones of Niger state, Nigeria. *10SR. Journal of research and method in Education*, 98(2): 53-59.
- Frankish, K. & Ramsey, W. M. (2014). *The Cambridge handbook of Artificial Intelligence*. Cambridge University press.
- Holmes, W., Bialik, M & Fadel, C. (2019). *Artificial Intelligence in Education. Promises and implications for teaching and learning*. Centre for curriculum design. All rights reserved.
- Idirisu, A., Oridigi, S., Muchiri, M & Kio, M. N. (2019). Senior High School Students Perception of Computer-Aided Instruction in North East Region of Ghana. *International Journal of Innovative Research and Advance Studies*. 6(8); 19-26.
- Karachi, A., Piri, Z., Akyuz, H. I. & Bilgici, G. (2018). Students Perception of an Intelligent Tutoring System. *International Journal of Computer Applications*. 182(22), 975-8887.
- Leddy, M & McCreanor, N. (2013). The Potential Utilization of Artificial Intelligence in Enterprises. *European Conference on Innovation and entrepreneurship* vol. 18(1); 526-535.
- Maghsudi, S., Lan, A. & Xu, J. (2021). Personalized education the artificial intelligence era. What to expect next *IEEE Signal Processing Magazine*. 38(3); 37-50.
- Marinsek, D., Pozun, R. & Korosec, T. (2023). Adoption of AI Technologies around the World. *Beyond Bits and Algorithms*.
- Raza, A. (2020). Intelligent Tutoring System and Metacognitive learning strategies. A survey Research Highlights in Mathematics, Science and Technology.
- Sang-Hun, C. (2016). *Googles' Computer Program*. The New York.
- The Impact of Artificial Intelligence in Education. Retrieved from [www.google.com](http://www.google.com) on 22/2/2024.
- What is an AI intelligence tutoring system and why you should use it? Retrieved from [www.google.com](http://www.google.com) on 22/2/2024.

## EFFECTS OF TALENT MANAGEMENT STRATEGIES ON CAREER PROGRESSION OF BUSINESS EDUCATORS IN NIGERIAN COLLEGES OF EDUCATION

<sup>1</sup>Olatunbosun Emmanuel Ajisafe & <sup>2</sup>Victor Imuentiyan Igbinedion

<sup>1</sup>Department of Business Education,  
Adeyemi Federal University of Education, Ondo  
Email: [safebosun@gmail.com](mailto:safebosun@gmail.com)

<sup>2</sup>Department of Vocational and Technical Education,  
University of Benin, Benin City, Nigeria

---

### Abstract

*The study investigated the effect of talent management strategies on career progression of business educators in Colleges of Education in South West Nigeria. Three research questions were raised and one hypothesis was tested at a 0.05 level of significance. A correlational descriptive survey research design was adopted with a population of 177 Business Educators across all the nine Colleges of Education in South West Nigeria. A census sampling was used with the entire population (177) because of its manageable size. The instrument used for data collection in this study was a questionnaire titled Talent Management Strategies Constructs and Career Progression Scales (TMSCCPS) adapted from human capital index of the Human Capital Institute (2008). The instrument was subjected to face and content validity from Department of Education Evaluation and Counseling Psychology, University of Benin, Benin City, Nigeria. The reliability test was carried out using Cronbach Alpha which yielded a co-efficient of 0.93. The data collected from the respondents was analyzed using Mean, Standard Deviation, Pearson Product Moment Correlation Coefficient and Linear Regression statistics. The findings revealed that the overall correlation between talent management strategies dimensions and career progression of Business Educators is positive and high. It was however recommended among other things that, there should be deliberate attempts made by college managements and regulatory agency at focusing on the development of talents which is equal to making systematic investments in human capital in Nigerian colleges of education.*

**Keywords:** Talent Management, Talent Development, Talent Retention, Career Progression, Business Educators

### Introduction

Career progression today occupies a central point of discussion in the human capital development of tertiary educators in Nigeria, with business educators not an exemption; and there has been an incredible pressure on human resource managers to meet up with the continuous changing environment, most especially as it relates to human resource in business education programme in Nigerian colleges of education. The cardinal objective of business education programme in colleges of education in Nigeria is to prepare the would-be teachers in areas of teaching, research and community development, (NCCE,

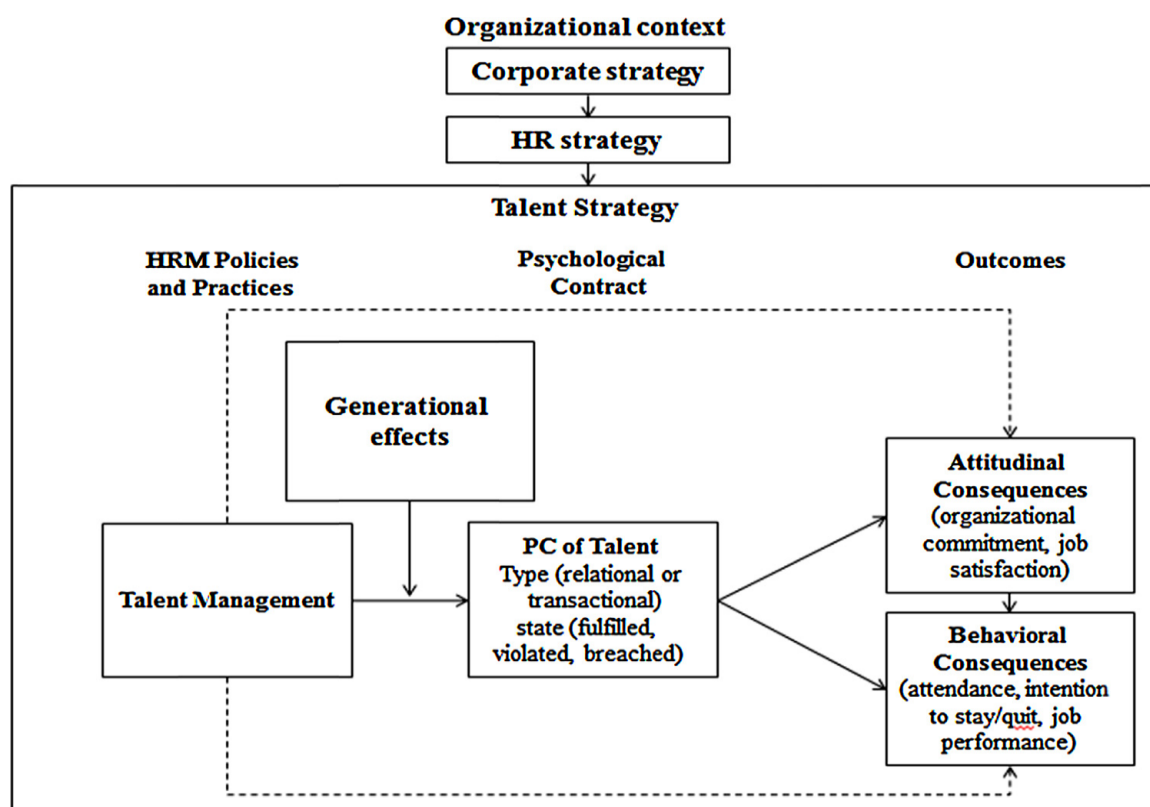
2020). The needed business educators therefore ought to be properly harnessed, attracted, recruited, developed and retained to achieve the goal of the programme, especially at the college of education sector. This may likely be done through the process of effective talent management strategies which appears not in existence at this sector of Nigerian educational system. It has being observed that a number of business educators rise through all the ranks in the colleges of education system and may even move to the universities (attrition) and continued in the manner of publishing just to gain promotions, while neglecting other requirements for career progression. Some may even get into positions of responsibilities such as Heads of Departments, Dean of Schools, Directors and Coordinators of Centres, Directorates or Units, without knowing what to do, thereby leading to mal-administration at every unit of the academic system. How then can writing only for publication assists in getting people on the job; work responsibly; display academic dexterity in instructional delivery and solving other myriads of problems in the college of education system arising from the process of teaching and learning? Despite the reported studies on the influence of talent management strategies on career progression in organizations including educational institutions, a serious gap still exists in literature on the correlation between talent management strategies and career progression of business educators in educational institutions in Nigeria; especially at the South West Colleges of Education. The researcher was therefore poised to investigate the correlation between talent management strategies and career progression of business educators in Colleges of Education in South West, Nigeria.

Talent is defined as “a natural ability to do something well” (Longman Dictionary of Contemporary English, 2020). According to Gagne (2000) the term talent designated the superior mastery of systematically developed abilities and knowledge in at least one of the fields of the human endeavour. Thorne and Pelant (2013) defined talent as someone who has the ability above others and does not try hard to use it. It could be regarded as the sum of a person’s abilities, his or her intrinsic gifts, skills, knowledge, experience, intelligence, judgment, attitude, character and drive. It also includes his or her ability to learn and to grow potential for further development. According to Avedon and Scholes (2010) the term talent means those individuals or groups that are strategically important to the purposes and goals of the organization. “Specifically, Avedon and Scholes (2010) posited that talent refers to those individuals and groups with strategic competencies that enable a company to achieve its short and long term goals.” However, for the purpose of this research study, a talented person is defined as “a person of high potential, who stands out as far as his/her knowledge, skills, experience, capabilities and development potential are concerned and who contributes to his/her organization's efficiency increase”. Hence, managing talent for optimal performance in an organization is germane and forms the fulcrum of the discussion in this study.

Talent Management is a concept increasingly on the minds of managers and practitioners as it becomes more difficult to attract, develop and retain talented employees in a fierce competitive business world. This situation is problematic in the Nigerian context as the Global Competiveness Report continues to rank the country low in terms of labour market efficiency and people development (World Competitiveness Report, 2021). A country's international competitiveness and growth of the knowledge community depends on its population having a strong and sustainable higher educational sector. Any institution that offers higher education is driven by a quality faculty which, become an invaluable asset for such an institution. Furthermore, attracting and retaining quality faculty is very important to educational institutions as a low faculty retention rate might create both monetary and academic consequences (Rensselaer Polytechnic Institute,

2012). Without well qualified and committed staff, no academic institution can ensure sustainability and quality over the long term (Pienaar & Bester, 2008). As Lewis and Heckman (2006) conclude, there is “a disturbing lack of clarity regarding the definition, scope and overall goals of talent management”. Nevertheless, certain commonly held views are in evidence, as several authors have observed (e.g. Lewis & Heckman, 2006; Collings & Mellahi, 2009; Silzer & Dowell, 2010). An initial view emphasizes the human capital aspect and therefore the definition of talent; a second view sees talent management as “a process through which employers anticipate and meet their needs for human capital” (Cappelli, 2008); and a third view perceives talent management as an instrument to reach economic outcomes (Gandossy & Kao, 2004).

This study would go along with the second view which sees talent management as a distinctive process that focuses explicitly on those persons who have the potential to provide competitive advantage for a company by managing those people in an effective and efficient way and therefore ensuring the long-term competitiveness of a company. Talent management practices ensure that the right people want to join the company and effectively bring new, talented workers into the company. Moreover, talented workers are identified and valued and incentives exist to retain them (Ringo, 2008; Brundage & Koziel, 2010). TM is a process which can be used to direct employees’ behaviour in a direction that fits business needs. The diagram below demonstrates talent management and its effects on organizational efficiency. Diagram explaining the impact of TM and Generational Effects on the Psychological Contract



**Figure 1:** Diagram explaining the impact of TM on the psychological contract moderated by the role of generational effects adapted from Marion & Lynn, 2014.

The objective of the suggested framework is to explain how TM affects the psychological contract between talents and their employers (organizations), with special consideration



given to generational effects. Talent management therefore seeks to identify, obtain, keep and develop those talented people. Talent management is defined by Tansley and Tietze (2013) as strategies and protocols for the systematic attraction, identification, development, retention and deployment of individuals with high potential for particular organizations. It is the process of ensuring that the organization has talented people it needs to attain its business goals. It involves the strategic management of the flow of talent through an organization by creating and maintaining a talent pipeline. There are eight dimensions of talent management strategies according to the Human Capital Institute (2008) which include; talent acquisition, talent development, talent retention, management commitment, talent review process, workforce planning, staffing and performance management. In this study, only two dimensions that appear most relevant and appealing to business educators career progression in colleges of education are studied (viz talent development and talent retention).

Rothwell and Kanazas, (2023) defined talent development as the process of facilitating employee learning, competencies, performance and change through organized interventions and initiatives and management actions for improving an organization's performance capacity, and competitive advantage. Talent development ensures that high-potential people recruited into the organization are assessed regularly, given the opportunities to develop their talent through being exposed to different situations and environments through their careers and given the opportunity to advance to ever-increasingly challenging opportunities. Dychtwald, Erickson and Morison (2006) argue that the opportunity to learn, grow and to try new things was ranked third among ten basic factors in a nationwide survey conducted on workers and their preferences. It ranked even higher than additional compensation, vacation, flexible schedule and flexible workplace. Wagner & Harter (2006) indicate that currently it is imperative for the organization over the long run to have employees trained and have supervisors and mentors who are fully committed to discussing performance and giving feedback to employees. It is also important that organizations when considering developing talent, they should give allocation of resources a priority when it comes to roles and to people who will make most difference. More consideration should be put on how to create the right environment for talent to thrive. Essentially to this process, it is important to match the way people learn with the needs of talented people and provide a range of varied practices to promote professional learning (Rothwell, 2012). All processes should work together, for example effective performance management and professional reviews should be a starting point for staff learning and development. It is important to consider the resources available for the development of all staff (Davies & Davies, 2010).

Talent retention otherwise referred to as succession planning is a process through which people with high potentials are identified for anticipated future needs. It is a proactive approach to managing talent as it involves a well prepared development plan of these individuals so that talent pool or leadership pipeline is available when needed to meet organizational demands as they arise. Others have argued that succession planning management should be extended to all employees, including those that are below leadership level. The provision of development opportunities to all employees at all levels add to the retention value as well as to the increase in profitability associated with a competent and motivated workforce (Kalu, Ezieshi and Okoro, 2017). Organizations with high quality leadership development programs and formal succession management programs are often the one that reach superior business results. This implies that increasingly uptight labour markets make succession management a business importance and thus, put pressure on organizations to identify and accelerate the development of

future leaders from within. Given this pressure, organizations need to have a successful succession management policy in place, with a particular focus on the continuity of key specialists and leaders.

Talent retention therefore, refers to the ability of an organization to retain its employees through building networks, finding mentors and helping employees grow and develop while feeling more connected and engaged in their work. A business educator with potentials and conducive workplace environment to progress would likely be retained on the job to assist in building the institution. The overall objective of development and retention therefore, depicts the organization's ability to attract, select, develop and retain key employees to give it a comparative advantage over its contemporaries. Highly talented business educators can be characterized through a variety of competencies, such as peculiar skills, abilities, experience, knowledge, intelligence, character and drive, or the ability to learn and grow within an organization including the college of education system. The ability of individuals and organizations to manage these characteristics which are embedded in talent management strategies as mentioned in the earlier dimensions may determine to a large extent career progression.

Business management literature has severally reported talent management strategies differences by age and gender within the general population, while research focused on talent management strategies among business educators in Nigerian colleges of education is rather sparse. It is in this context that the correlation between talent management strategies and career progression of business educators was investigated as an intervention to career advancement criteria and challenges among business educators in Nigerian colleges of education.

### **Research Questions**

The following research questions guided the study

- I. What is the relationship between talent development and career progression of business educators in South West Colleges of Education?
- II. What is the relationship between talent retention and career progression of business educators in South West Colleges of Education?
- III. What is the combined relationship between talent management strategies dimensions and career progression of business educators in South West Colleges of Education?

### **Hypothesis**

The null hypothesis was tested at 0.05 level of significance

There is no significant relationship between talent management strategies and career progression of Business Educators in Southwest Colleges of Education.

### **Methodology**

A correlation descriptive survey research design was adopted in this study. The population of this study comprised 177 Business Educators across all the nine (9) Colleges of Education in South West Nigeria. The entire population of 177 was used as

sample for the study because of its manageable size. Hence, census sampling was used. The instrument used for data collection in this study was a questionnaire. The questionnaire was titled Talent Development and Talent Retention Strategies Constructs and Career Progression Scales (TDTRSCCPS) adapted from human capital index of the Human Capital Institute (2008) used to measure the perceived talent management strategies from previous research. The index consist originally 41 items and measure eight talent management practices. It was however modified to 20 items because two dimensions of talent management strategies (talent development and talent retention) were covered in the present study. Respondents were required to indicate the extent of their agreement with each statement on a four-point rating scale ranging from strongly agree (4); agree (3) disagree (2) and strongly disagree (1). Career Progression Items (CPI) was developed by the researchers after a careful literature review. It consists of 20-items on a four-point rating scale of strongly agree (4); agree (3) disagree (2) and strongly disagree (1). The instrument was subjected to face and content validity by three experts from the Department of Education Evaluation and Counseling Psychology, Faculty of Education, University of Benin, Benin City, Nigeria. The reliability test was carried out using Crombach Alpha which yielded a co-efficient of 0.93. This was considered adequate for the study. Copies of the questionnaire were administered with the help of 5 research assistants. The instrument was retrieved from the respondents within an interval of two weeks with 168 returned from a population of 177 representing 95% return rate. The data collected from the respondents was analyzed using Pearson Product Moment Correlation Statistics and Linear Regression Analysis. The Pearson r was used to analyze the data collected to answer research questions, while linear regression analysis was used to establish the level of the relationship between the independent and dependent variables of the study and testing hypotheses at 0.05 level of significance in order to determine the percentage contribution of business educators’ talent management strategies constructs to career progression.

## Results

**Table 1:** Pearson Product Moment Correlation of Relationship between talent development and career progression of Business Educators

Variables	N	Mean	SD	r
Talent Development	168	2.8837	.52849	.621
Career Progression	168	2.9454	.48710	

**Sources:** Computed from Field Work, (2024)

The results in Table 1 demonstrate the relationship between talent development and career progression of Business Educators. The table displays a mean of 2.8837 and 2.9454, similarly a standard deviation of .52849 and .48710 for talent development and career progression respectively. The coefficient value obtained for talent development and career progression is .621 which means positive and high relationship. It therefore means that the relationship between talent development and career progression of Business Educators in Southwest Colleges of Education is positively high.

**Table 2:** Pearson Product Moment Correlation of Relationship between talent retention and career progression of Business Educators

Variables	N	Mean	SD	r
Talent Retention	168	2.8363	.53191	.612
Career Progression	168	2.9454	.48710	

**Sources:** Computed from Field Work, (2024)

The analysis in Table 2 shows the relationship between talent retention and career progression of Business Educators. The table shows that the correlation coefficient of .612 is positive but high. The data analysis further shows that mean of 2.8363 and 2.9454, as well as standard deviation of .53191 and .48710 for talent retention and career progression respectively. This therefore indicates that the relationship between talent retention and career progression of Business Educators in Southwest Colleges of Education is positively high.

**Table 3:** Pearson Product Moment Correlation of Relationship between talent management strategies dimensions and career progression of Business Educators

	1	2	3	4
1.Talent Development	.654	1		
2.Talent Retention	.509	.623	1	
3.Talent Management Strategies	.872	.909	.767	1
4.Career Progression	.522	.621	.612	.673

**Sources:** Computed from Field Work, (2024)

The data presented in Table 3 indicates the relationship between talent management strategies dimensions and career progression of Business Educators. The coefficients range from .509 to .909 among the variables. The correlation coefficients between dimensions of talent management strategies and career progression range from .522 to .673. Talent development and talent retention have a positive and high correlation with career progression of Business Educators. Thus, the overall correlation between talent management strategies dimensions and career progression of Business Educators is positive and high (.673).

**Table 4:** Summary of ANOVA on the multiple regression estimates between talent management strategies and career progression of Business Educators

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	18.987	3	6.329	50.295	.000 <sup>b</sup>
Residual	20.637	164	.126		
Total	39.623	167			

**Source:** Field Study (2024)

The data presented in Table 4 depicts that the ANOVA summary of multiple regression based on career progression as predicted by the talent management strategies of business educators, is statistically significant ( $F(3, 164) = 50.295, p=.000<.05$ ). Thus, the null hypothesis is rejected. This means talent management strategies significantly predict career progression of Business Educators. That is, there is significant relationship between talent management strategies and career progression of Business Educators in Southwest Colleges of Education.

**Table 5:** Multiple regression coefficients on talent management strategies predicting career progression of Business Educators

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.911	.168		5.423	.000
Talent Development	.288	.077	.313	3.762	.000
Talent Retention	.315	.067	.344	4.707	.000

**a. Dependent Variable: Career Progression**

**Note. R = .692; R-square = .479; Adjusted R-square = .470; p < .05**

**Source:** Field Study (2024)

The data presented in Table 5 indicates that two of the talent management strategies predicting business educators career progression were found to be significant such as talent development (p = .000) and talent retention (p = .000). The adjusted R square value is .470, which indicates that the 47.0% of the variance in business educators’ career progression is explained by talent management strategies. This value is a large effect (Cohen, 1988). From the overall model analysis, the null hypothesis is rejected. However, the model analysis shows that the talent development and talent retention have more predictive influence on Business Educators’ career progression.

**Discussion**

The result of data analysis from the investigation carried out by the researchers on research question one revealed a positive, but high relationship coefficient value obtained for talent development and career progression. Hence, there is positively high relationship between talent development and career progression of business educators in Southwest colleges of education. The finding also supports previous studies of Gandossy & Kao; (2004) who posited that career options and progress are crucial for the motivation of talent. This arises because talents prefer non-material compensations, such as career prospects, challenging job content and scope of action, over monetary compensation and are apparently looking out for developmental perspectives. The finding also corroborates the study of Rothwell (2012) who reported that talent development as a strategy of talent management is important to match the way people learn with the needs of talented people and provide a range of varied practices to promote professional learning for the promotion of intellectual capital and career advancement. The finding is also consistent with the previous study of Pienaar & Bester (2008) who reported that talent development leads to productive employees, because without it, they cannot be well qualified and committed staff, to propel academic institutions which ensure career sustainability and quality over the long term. It implies that, a well-developed career progression path of business educators in Southwest Colleges of Education would ensure that high-potential people recruited into the colleges are assessed regularly, given some opportunities to develop their talents through being exposed to different situations and environments through their careers and given the opportunity to advance to ever-increasingly challenging opportunities.

The results of data analysis on research question two revealed a high and positive correlation coefficient between talent retention and career progression respectively. This implies that, there is positively high relationship between talent retention and career progression of business educators in Southwest colleges of education. This finding is in



consonance with the opinion of Avedon and Scholes (2010), who posited that the provision of development opportunities to all employees at all levels, add to the retention value as well as to the increase in profitability associated with a competent and motivated workforce. The finding also corroborates the work of DeConinck and Johnson (2009) who found that talents are valued and retained if specialized programmes exist within the organization to make people stay and grow their career. This would make workers get committed to meaningful work combined with special rewards, with the ultimate goal of career progression.

The findings from research question three shows that the overall correlation between talent management strategies dimensions and career progression of business educators is positively high. More so, findings from the null hypothesis showed that talent management strategies significantly predict career progression of business educators. That is, there is significant relationship between talent management strategies and career progression of business educators in Southwest Colleges of Education. By implication, for business educators to progress on the job, dimensions of talent management strategies must exist in Colleges of Education which should be put in place by managers of such colleges. Business educators must be consciously trained and retrained, mentored and coached to sustain career progression. This is in supports of the study of Kalu, Ezieshi and Okoro (2017) that reported that components of talent management such as succession planning, compensation management human capital development are the key strategies that deliver organizational performance. This implies that irrespective of the nature of organization, hence; talent management strategies are necessary impetus for organizational job performance which is a sine qua non to career progression. The finding is also in tandem with studies of Ringo, (2008); Brundage & Koziel, (2010) who believed that there are benefits derived from talent management which include identification of employees with values and incentives to retain them on the job which leads to reduced hiring cost, efficient and effective inspired and committed team and consequently improved efficiency in service delivery. They posited that university with talent management strategies would assume a new status as a fulfilling place to work. This would invariably assist in attracting new talent, which is the reason for implementing talent management in the first place.

## **Conclusion**

Based on the findings of the study, it is concluded that business educators in southwest Colleges of Education need more grooming in talent management strategies for career progression. Despite its positive correlation; the dimensions of these variables appear not in existence based on the findings from the analysis; hence, the need to incorporate elements of talent management strategies as human resource factors that are positively correlated and capable of predicting business educators career progression in Southwest colleges of education.

## **Recommendations**

- I. Talent management strategies and practices with a strong focus on career progression and its alignment with overall business education goals in Colleges of Education should be instituted in Nigerian Colleges of Education system. The idea of employing business educators and be allowed to learn and do things by trial and error should be discouraged; hence, lecturers recruited newly should be attached



to senior colleagues for coaching and mentoring to assist their talents growth with seamless career progression.

- II. There should be deliberate attempts made by college managements and regulatory agency at focusing on the development of talents which is equal to making systematic investments in human capital in Nigerian colleges of education. This would in no small measure boost the intellectual capital base and influences not only in the current institution's human resources, but also in the future in preparation for the proposed degree awarding status and being planned to be implemented by the different levels of government in Nigeria.
- III. Government and regulatory agency (NCCE) should immediately direct management of Colleges of Education to float programmes such as seminar series, lecture series, workshops, etc which are not in existence in Colleges of Education system to build and enhance the capacity of business educators in Colleges of Education in Nigeria for the purpose of retaining them to help build the college system. This can be achieved through increased budgetary allocation to finance expenditure for the implementation of such programmes that can boost talent management strategies for knowledge update in the emerging global academic environment. Also, the training and development programmes would continually expose them to best academic global best ethical practices and behaviour in the educational industries to compete favourably with their counterparts across the tertiary institutions in the world.
- IV. College based research and development initiatives should be adequately funded by government in Colleges of Education system to reveal new pedagogies, innovations, learning aids and techniques as a way of talent management strategies of business educators and other lecturers in Colleges of Education system. This would help widening their horizon and inculcate in them the correct ethical behaviour in academics as impetus for job satisfaction and career progression.

## References

- Avedon, M. J., & Scholes, G. (2010). Building competitive advantage through integrated talent management. In R. Silzer, & B. E. Dowell (Eds.), *Strategy-Driven Talent Management: A Leadership Imperative* (pp. 73-122), San Francisco: Jossey-Bass, CA.
- Berke, D., Kossler, M. E., & Wakefield, M. (2008). *Developing leadership talent*. San Francisco, CA: Pfeiffer.
- Brundage, H., & Koziel, M. (2010). Retaining top talent still a requirement for firms. *Journal of Accountancy*, 209(5), 38–44.
- Cappelli, P. (2008). Talent management for the twenty-first century. *Harvard Business Review*, 86(3), 74.
- Collings, D. G., & Mellahi, K. (2009). Strategic talent management: A review and research agenda. *Human Resource Management Review*, 19(4), 304–313.
- Davies, B., & Davies, B. J. (2010). Talent management in academies. University of Hull, UK. *International Journal of Educational Management*, 24(5), 418- 426.
- DeConinck, J. B., & Johnson, J. T. (2009). The effects of perceived supervisor support, perceived organizational support, and organizational justice on turnover among salespeople. *Journal of Personal Selling & Sales Management*, 29(4), 333–350.

- Dychtwald, K., Erickson, T. J., & Morison, R. (2006). *Workforce crisis: How to beat the coming shortage of skills and talent*. Boston: Harvard Business School Press.
- Friederichs, P., & Labes, M. (2006). Human capital management. In H. Kruppke, M. Otto, & M. Gontard, (Eds.): *Human capital management. Personal prozesse erfolgreich managen* [in German]. Springer, Berlin/Heidelberg, 17–26.
- Gandossy, R., & Kao, T. (2004). Talent wars: out of mind, out of practice. *Human Resource Planning*, 27(4), 15–19.
- Human Capital Institute Africa & Hewitt's Human Capital Consulting. (2008). The state of talent management: Today's challenges, tomorrow's opportunities. *Human Capital Leadership Excellence e-Journal*, 1(10), 22-29.
- Human Capital Institute (2011). Human capital institute stakeholder survey.
- Kalu, E. A., Ezieshi, F. M., & Okoro, A. A. (2017). Impact of talent management strategies on organizational performance in selected deposit money banks in Lagos State, Nigeria. *International Research Journal of Management, IT & Social Sciences (IRJMIS)*, 4(2), 124-138.
- Lawler, E. E. (2008). Choosing the right talent management strategy. *Workspan*, 51(7), 73–75.
- Lewis, R. E. & Heckman, R. J. (2006). Talent management: A critical review. *Human Resource Management Review*, 16(4), 139–154.
- Marion, F., & Lynn, S. (2014). Generational challenges to talent management: A framework for talent retention based on the psychological-contract perspective. *Journal of World Business*, 49(2), 62-71.
- National Commission for Colleges of Education (2020). *Minimum standards: Education & vocational technical education* (6th Ed.). Abuja: NCCE.
- Nicolene, B., Puleng, M., & Nico, S. (2014). Talent management, work engagement and service quality orientation of support staff in a higher education institution. *Mediterranean Journal of Social Sciences MCSER Publishing, Rome-Italy*, 5(4), 69-77.
- Pienaar, C., & Bester, C. L. (2008). The retention of academics in the early career phase: Empirical research. *SA Journal of Human Resource Management*, 6(2), 32-41.
- Ringo, T. (2008). *Integrated talent management: Part 1 – understanding the opportunities for success*. New York: IBM, Somers.
- Rothwell, W. J. & Kanazas, H. C. (2023). *The strategic development of talent: A framework for using talent to support your organisational strategy*. Canada: HRD Press Inc.
- Rothwell, W. J. (2012). Talent management: Aligning your organization with best practices in strategic and tactical talent management. *Training & Development*, 39(1), 6-7.
- Tansley, C., & Tietze, S. (2013). The currency of talent management—A reply to talent management and the relevance of context: Towards a pluralistic approach. *Human Resource Management Review*, 23(4), 337 – 340.
- Thorne, K., & Pellant Tansley, C. (2013). The currency of talent management—A reply to talent management and the relevance of context: Towards a pluralistic approach. *Human Resource Management Review*, 23(4), 337 – 340.
- Silzer, R., & Dowell, B. E. (2010). *Strategy-Driven talent management*. San Francisco, CA: Wiley.
- Stanley, A., & Oghoator Igiebor, H. (2015). Talent management and employees retention in Nigerian Universities. *NG-Journal of Social Development*, 5(1), 23-31.
- Wagner, R., & Harter, J. K. (2006). The elements of great managing. *Journal of Human Resources*, 978(1), 345-356.

## STUDENTS' PERCEPTIONS ON DIMENSIONS OF EDUCATIONAL PHILOSOPHIES: TOWARDS CURRICULUM FOR ACTIVATING INTELLECTUAL VIRTUES AND INCULCATING MORAL VALUES AT SSU, SOKOTO STATE, NIGERIA

<sup>1\*</sup>Ahmad Tijani Surajudeen and <sup>2</sup>Haliru Shehu

<sup>1\*</sup>Department of Curriculum Studies,  
Faculty of Education,  
Sokoto State University, Sokoto  
Email: [sirajudeen\\_20@yahoo.com](mailto:sirajudeen_20@yahoo.com)

<sup>2</sup>Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University (SSU), Sokoto, Sokoto State-Nigeria  
Email: [hallirushehuyari@gmail.com](mailto:hallirushehuyari@gmail.com)

---

### Abstract

*Educational philosophies embodied in the course outline are an integral part of curriculum and instruction specifically at the Faculty of Education, Sokoto State University (SSU). Several studies have investigated the importance of foundation of educational philosophies in curriculum and instruction. Nonetheless, little attention is given to the extent by which various dimensions of educational philosophies (perennialist, essentialist, progressivist, reconstructionist/ critical theorist) can activate intellectual virtues and moral standards among students of Sokoto State University (SSU) in particular. The primary objective of this paper was to investigate the perceptions of faculty of education students at Sokoto State University (SSU) on dimensions of educational philosophies specifically towards implementing curriculum for activating learners' intellectual virtues and moral values. A survey questionnaire was used to collect data from 169 respondents among 200 and 300 level students at Faculty of Education, Sokoto State University. For the data analysis, descriptive statistics, frequencies, percentages, mean and standard deviation were used. The findings from this showed that the students perceived four components of educational philosophies (perennialist, essentialist, progressivist and Reconstructionist views) very important in activating intellectual virtues and inculcating moral standards at Sokoto State University (SSU). It is therefore recommended that various components should be integrated into academic programmes; however, students' needs, interests and capacities should be taken into consideration rather than an emphasis on the content of academic programmes. Also, it is important that teaching/learning process should emphatically stress on student-centeredness.*

**Keywords:** Perennialist view, Essentialist view, Progressivist view, Reconstructionist/ Critical Theorist view

## **Introduction**

University as a hub of education and citadel of learning should be all-encompassing towards designing curriculum or academic programmes that will emphatically stress on the activation of intellectual virtues and moral standards. Hence, literature acknowledges that, educating youngsters in the society is a collective responsible of individuals and literature emphasizes on the paramount importance of indigenous philosophy of education in the country while educating the youngsters (Onwudinjo, 2023). Studies have shown that education plays a very important role with regard to intellectual virtues and moral standards as an integral part of ethical visions or manifestations of education through philosophical practices (Mortimer, 1990, Hansen, 2019). The role of university should consequently reflect in addressing social problems such as: inequality, poverty, terrorism, violence etc. Undoubtedly, the prevalent issue of tribalism, nepotism and discrimination through social networks assert that the educational philosophies have not be judiciously utilized to foster intellectual virtues and moral standards among the students in order to promote peaceful co-existence in the society.

With the aforementioned challenges, it is therefore imperative to address these problems through curriculum and instruction specifically teaching and learning of educational philosophies in higher institutions in the entire Nigeria and Sokoto State University (SSU) in particular using the view-lens of intellectual and moral standards. Sokoto State University (SSU) was established in 2013 with the prime objective to cater for educational needs of youth in the state in specific and the country as a whole. Undoubtedly, education is a vibrant mechanism in activating the sense of intellectual virtues and inculcating moral values or standards. More importantly, it should be consequently used to intellectually solve different educational and societal problems in the country.

Indeed, this is important in the context of Sokoto, especially with the establishment of a new university like Sokoto State University (SSU) which is expected to emphatically stress on outcome-based learning as meticulously and lucidly elaborated in the National University Commission (NUC)'s benchmark (NUC, 2007). The outcome-based learning emphasizes on the overall development of the country; nonetheless, education is a prerequisite for this development through lifelong learning (Kaygin, Yilmaz and Semerci, 2017). Several studies have elaborated the importance of philosophies of education in connection with the curriculum design approaches in order to develop the personality of the learners holistically (Oroko, 1990; Ezewu, 1993; Amaeli, 2005; Kozikoğlu and Uygun, 2018). Nonetheless, it is important to clarify a distinction between philosophy of education and educational philosophy. For instance, Nigerian Philosophy of Education among others includes “promotion, progress and creative potentials and skills of individuals while educational philosophies are the application of philosophical concepts in achieving the aims, objectives and goals of education as an integral part of ethical visions of education as literature contends (NPE, 2013; Hansen, 2019; Karaduman and Ucar, 2020). Furthermore, there is a connection between the outcome-based learning and intellectual virtues and moral values through teaching and learning process as an integral part of educational philosophies (Muhammadipouya and Mohammadipouya, 2019). Indeed, the university expectedly should be a replica of the societal needs of which holistic approach to societal issues is an essential need of the society whereby the

instructional pedagogical method should be emphasized as literature contends (Wenger, 1998; Alemdar and Aytac, 2022).

Therefore, in order to address the aforementioned problems, the educational philosophies as integral part of curriculum and instruction courses in the university should be utilized. This is so because the Faculty of Education core courses for all students among others are Curriculum and Instruction. It is thereby important to examine the significance of educational philosophies in relation to Curriculum and Instruction course among the students in order to activate learners' intellectual virtues and moral values instead of teaching and learning of curriculum and instruction for grade purpose among students. Therefore, this study seeks the perceptions of the faculty of education students at Sokoto State University (SSU) regarding the components of educational philosophies (i.e., Perennialist, Essentialist, Progressivist and Reconstructionist views) regarding the extent by which intellectual virtues and moral standards have been activated through the teaching of curriculum and instruction.

### ***Literature Review***

This part presents review of extant literature specifically educational philosophies are various components are highlighted. Educational philosophies in Nigeria have been influenced by ancient philosophers like Socrates, Plato, and Aristotle, shaping subsequent educational thinkers such as John Dewey and Abraham Maslow (Hansen, 2019). Undoubtedly, the National Policy on Education in Nigeria reflects these philosophies, emphasizing the importance of values in education for social coherence and development (NPE, 2013; Onwudinjo, 2023). However, despite noble values outlined in the policy, the Nigerian education system faces challenges in effectively inculcating these values due to issues like the absence of value clarification and teachers' lack of preparedness for value inculcation (Ekefre, 2014; Muhammadipouya and Mohammadipouya, 2019). Additionally, the alignment of instructional components in Nigeria's tertiary education system, including curriculum standards, assessments, and classroom instruction, shows a high level of coherence but with a focus on low cognitive demand processes, potentially contributing to students' performance in various courses of study as well as lifelong learning (Kaygin, Yilmaz and Semerci, 2017; Kozikoğlu and Uygun, 2018). Efforts towards a paradigm shift in curriculum development are crucial for building a strong and effective education system in Nigeria that will foster intellectual virtues and moral values (Adirika, Okonkwo and Onyebuchi, 2017; Alemdar and Aytac, 2022). Undoubtedly, literature identifies different components of educational philosophies namely: Perennialism, essentialism, progressivism and reconstructionism. Each of these is explained in the subsequent paragraphs.

First, Perennialism, as a concept that emphasizes the continuous appraisal and reappraisal of educational systems based on changing societal needs and philosophies, plays a crucial role in shaping the personality of the learners through an effective design and implementation of curriculum in Nigerian tertiary institutions (Akomolafe, 2020). Ultimately, Perennialism, rooted in philosophy and reflective of societal needs, serves as a guiding principle for developing and implementing curricula that cater to the dynamic educational landscape in the 21st century (De Guzman, 2022). Nonetheless, the challenges faced in effectively implementing curricula, such as inadequate funding, teacher involvement, and student attitudes, underscore the importance of aligning curriculum content with emerging areas like Computer Aided Design (CAD) to meet



evolving educational demands (Ekefre, 2014). Additionally, the role of Educational Resource Centres (ERCs) in providing support, multimedia resources, and professional development opportunities for educators is vital in overcoming barriers to curriculum implementation and achieving national educational objectives as literature contends (Adirika, Okonkwo and Onyebuchi, 2017).

Second, essentialism, as a philosophical school of thought, significantly influences curriculum design and implementation in Nigerian schools by emphasizing a back-to-basics approach, focusing on transmitting a common core of knowledge systematically (Scholar, 2011). This approach aims to instil students with essential academic knowledge and skills necessary for citizenship and societal contribution, prioritizing subjects like grammar, literature, mathematics, sciences, history, and foreign languages (Idogho, 2016). The essentialist perspective advocates for a core curriculum centred around teachers, mastery of essential knowledge before progression, and grouping students based on intellectual abilities, while placing less emphasis on non-academic subjects (Scholar, 2011). By aligning curriculum development with essentialist principles, literature posits that Nigerian tertiary institutions can structure educational programmes that prioritize foundational knowledge and skills essential for students' holistic development and societal engagement (Adirika, Okonkwo and Onyebuchi, 2017).

Third, progressivism, as a modern educational philosophy, has significantly influenced the design and implementation of curriculum in Nigerian schools by advocating for student-centered approaches that prioritize students' skills development and encourage inclusive learning (De Guzman, 2022). This educational philosophy aims to transform authoritarian practices into democratic and respectful environments that nurture children's potential and abilities. Curriculum implementation in Nigeria heavily relies on teachers as the key implementers, emphasizing the importance of their involvement in planning and development processes to create a student-friendly school environment (Idogho, 2016). Dewey's educational ideas, which underpin progressivism, have shaped the educational foundation of Nigerian society, as evident in the nation's National Policy on Education, reflecting a longing for the removal of barriers to implementing progressive educational strategies (Hansen, 2019).

Fourth, reconstructionism philosophy in Nigerian schools significantly influences curriculum design and implementation by advocating for radical reforms to address social issues and promote equality (Olanrewaju, 2012). This approach emphasizes the need for a new social order and encourages students and teachers to become agents of social change. In the Nigerian context, effective teaching approaches like role-playing and storytelling are utilized to instil values such as social justice, aligning with the Reconstructionist perspective (Aboluwodi, 2011; Irabor, Ola-Obitusin and Olufowobi, 2020). Additionally, the COVID-19 pandemic has prompted innovative reconstruction of teaching and learning techniques in Nigeria, leading to the integration of ICT tools and digital platforms in curriculum delivery (Irabor, Ola-Obitusin and Olufowobi, 2020). By embracing Reconstructionism, Nigerian schools can adapt their curriculum to foster social awareness, equality, and technological advancements in education (Igwe, Rufai and Olufemi, 2013). In a nutshell, the review of cursory literature has highlighted different components of educational philosophy as the foundation of curriculum in the Nigerian tertiary institutions.



## Methodology

Survey research method was used to collect data among Faculty of education students specifically those who are presently in 200 and 300 levels, Sokoto State University (SSU), Sokoto, Nigeria. Cresswell (2014) regards survey as one of appropriate techniques in educational research. The entire students were regarded as the population of this study. Convenient sampling technique was used to select 169 as sample of study. Questionnaire called “Survey on Educational Philosophies (SEP)” was used as an instrument of the study. There are two sections in the instrument. Section A covers demographic (gender, age, level of education, department, specialization, expected year of graduation). While Section B covers items on different factors embodied in the instrument are: Perennialist view, Essentialist view, Progressivist view, Reconstructionist/ Critical Theorist view. A 5-likert scale namely: 1= strongly disagree (SD), 2=disagree (D), 3=neutral (N), 4=agree (A), 5= strongly agree (SA) which was used in the instrument in order to gather data from the respondents. The opinions of two lecturers at the faculty of education were sought in order to validate the instrument specifically looking at the flexibility of the items. Subsequently, a pilot test was carried out to examine the reliability of the items reporting Cronbach’s Alpha using SPSS version 21.0. There were four factors that were investigated and a total number of 20 items were designed to measure four factors examined in this study. Therefore, the results of reliability (Cronbach’s Alpha) of each factor are presented as follows: Perennialist View (PV) =.718; Essentialist View (EV) =.731; Progressivist View (PROGV) =.605; Reconstructionist/ Critical Theorist View (RCTV) =.744. Hence, the data is reliable according to the criteria of Pallant (2011). For the data collection on the study, 169 questionnaires were used for the analysis. For analysis of data, descriptive statistics, frequency, percentage, mean and standard deviation were used/ The overall results of the study were presented in the subsequent sub-heading.

## Results

The subsequent sub-headings present the results about respondents’ demographic information and four identified factors examined in this paper which are: Perennialist View (PV); Essentialist View (EV); Progressivist View (PROGV) and Reconstructionist/ Critical Theorist View (RCTV).

### *Demographic Information of Respondents*

Indeed, respondents’ gender, age, level of education, department, specialization and expected year of graduation are presented. The majority of respondents were males (120 or 71%) while females were 49 or 29%. The responses obtained from the respondents indicate that the age of majority (i.e. 95 or 56.2% were between 21 and 25 years old. This is followed by the ages between 16 and 20 which is 51 (30.2%). The respondents with ages between 26 and 30 were 16 or 9.5% while just only 7 or 4.1% of the respondents indicated that their ages were 31 and above. The level of education by the majority of respondents (90 or 53.3%) is 300 level while those who are in 200 level were 79 (46.7%). Onwards, apart from the respondents’ level of education, the majority of respondents (123 or 72.8%) are in the department of educational foundations while 46 (27.2%) of the respondents were from the department of science education. There is no any respondent from the department of curriculum studies at the time of data collection. In the entire faculty of education, Sokoto State University (SSU), there seven major units namely: management, Guidance and Counselling, Biology, Chemistry, Computer Science,

Physics, mathematics and Curriculum Studies. Many of the respondents (68 or 40.2%) specialize or belong to management unit while Guidance and Counselling is the second unit with highest responses (55 or 32.5%). Other units with different frequencies and percentages are: Computer Science (17 or 10.1%); Biology (14 or 8.3%); Physics (13 or 7.7%) and Chemistry (2 or 1.2%) while there was no any respondent from mathematics and other units from Curriculum Studies department. Table 1 shows frequencies and percentages of respondents' demographics with regard to gender, age, level of education, department, and area specialization:

**Table 1: Students' Demographic Information**

<b>Demographic Information</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Gender:</b>		
a. Male	120	71%
b. Female	49	29%
<b>Total:</b>	<b>169</b>	<b>100%</b>
<b>Age:</b>		
a. 16-20	51	30.2%
b. 21-25	95	56.2%
c. 26-30	16	9.5%
d. 31 and above	7	4.1%
<b>Total:</b>	<b>169</b>	<b>100%</b>
<b>Level of Education:</b>		
a. 200	79	46.7%
b. 300	90	53.3%
<b>Total:</b>	<b>169</b>	<b>100%</b>
<b>Department:</b>		
a. Science Education	46	27.2%
b. Educational Foundations	123	72.8%
c. Curriculum Studies	--	--
<b>Total:</b>	<b>169</b>	<b>100%</b>
<b>Specialization (Unit):</b>		
a. Educational Management	68	40.2
b. Guidance and Counselling	55	32.5
c. Biology/Education	14	8.3%
d. Chemistry/Education	2	1.2%
e. Computer Science/Education	17	10.1%
f. Physics/Education	13	7.7%
g. Curriculum Studies	--	--
<b>Total</b>	<b>169</b>	<b>100%</b>

### ***Perennialist View (PV)***

Basically, five items were designed to measure perennialist view among 200 and 300 level students, Faculty of Education, Sokoto State University (SSU). There were different opinions expressed by the respondents based on the findings from descriptive statistics. In line with perennialist educational philosophical viewpoint, majority of the respondents (n=115, 68.0%) asserted that their rational faculty and reasoning ability towards understanding paramount importance of intellectual virtues and moral standards in the society (M=3.69, SD=1.02). Just only 21 (12.4%) said that they disagreed while 33 or 19.5% of respondents were neutral. Pertaining to the teaching and learning of curriculum and instruction course, specifically, the role mental discipline as an integral component of

perennialist view, majority of the respondents (n=151, 89.4%) agreed that they have been given proper training in fostering their intellectual potentials (M=4.21, SD=0.79). In addition, the entire sample (n=145, 85.8%) agreed that Western education or civilization is important to be studied in order to solve multifarious societal problem. However, there were few respondents that disagreed (n=10, 5.9%) and maintained neutrality (n=14, 8.3%) respectively. Similarly, the majority of respondents (n=121, 71.6%) agreed that, they always like to acquire great ideas of Western civilization in promoting intellectual virtues in the society. However, a few numbers of respondents (n=28, 16.6%) disagreed with this statement (M=3.80, SD=1.18). Pertaining to the perennialist school of thought, a total number of 112 (66.3%) strongly agreed that they appreciate perennialist view because it stresses on the content. Nevertheless, only 9 (5.4%) of the respondents disagreed while 48 (28.4%) of the respondents said that they were neutral. Table 2 explains frequencies and percentages on Students’ Perceptions on Perennialist view (PV):

**Table 2:** Students’ Responses on Perennialist View

S/N	Items	Strongly Agree & Agree	Neutral	Strongly Disagree & Disagree	Mean	Standard Deviation
1.	My rational faculty has improved to enable attain a level of reasoning ability on its paramount importance in the society.	68.0% (115)	19.5% (33)	12.4% (21)	3.69	1.02
2.	Mental discipline through teaching and learning has given proper training to my intellectual potentials.	89.4% (151)	7.1% (12)	3.6% (6)	4.21	0.79
3.	Western education is important to me in order to solve different problems in the society.	85.8% (145)	8.3% (14)	5.9% (10)	4.42	0.93
4.	I always like to acquire understanding about great ideas of western education in order to promote intellectual virtues.	71.6% (121)	11.8% (20)	16.6% (28)	3.80	1.18
5.	I appreciate perennialist school of thought because it emphasizes on the importance of content.	66.3% (112)	28.4% (48)	5.4% (9)	3.71	0.86
<b>Total</b>		<b><u>381.1</u></b>	<b><u>75.1</u></b>	<b><u>43.9</u></b>	<b><u>19.8</u></b>	<b><u>4.78</u></b>
<b>Total Number of Items</b>		<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>
<b>Mean</b>		<b>76.22</b>	<b>15.02</b>	<b>8.78</b>	<b>3.96</b>	<b>0.95</b>

S/N	Items	SA(%)	A(%)	D(%)	SD(%)
-----	-------	-------	------	------	-------

1	Drug abuse make students fail exams	107(29)	82(22)	94(23)	81(22)
2	Drug abuse among student result to school drop-out	74(20)	88(24)	106(29)	98(27)
3	Drug abuse result to mental problems to students	106(29)	115(32)	78(21)	65(18)

### **Essentialist View (EV)**

Pertaining to essentialist view in relation to educational philosophies, majority of the respondents (n=131, 77.5%) agreed that the elder generations should be responsible for the transmission of accumulated wisdom of the past to the younger generation. Nonetheless, only 15 (8.9%) disagreed with this (M=4.00, SD=0.96). In addition, a total number of 163 (96.4%) strongly believed that they prefer to acquire knowledge in a systematic way (M=4.48, SD=0.708) while just only 3 (1.8%) disagreed in this regard. Furthermore, several numbers of the respondents (n=150, 88.8%) strongly believed that educational system should emphasis on both intellectual and moral developments in order to promote peaceful co-existence in the society (M=4.42, SD=0.79); a reasonable number of respondents (n=121, 61.6%) also agreed that intellectual virtues should be instrumental or prerequisite for moral standard among the students in particular and society in general (M=3.93, SD=1.03). A total number of 154 (91.1%) respondents strongly believed that their learning experiences at Sokoto State University (SSU) sturdily based on knowledge, skills and rigorous academic activities (M=4.28, SD=0.67). Table 3 explains frequencies and percentages on Students' Responses on Essentialist View (EV):

**Table 3:** Students' Responses on Essentialist View

S/N	Items	Strongly Agree & Agree	Neutral	Strongly Disagree & Disagree	Mean	Standard Deviation
1.	I believe that accumulated wisdom of the past should be transmitted from the elder generations to the younger generations.	77.5% (131)	13.6% (23)	8.9% (15)	4.00	0.96
2.	I like to acquire knowledge in a systematic way.	96.4% (163)	1.8% (3)	1.8% (3)	4.48	0.70
3.	Education should emphasize on intellectual and moral developments in order to promote development in the society.	88.8% (150)	7.1% (12)	4.1% (7)	4.42	0.79
4.	Intellectual virtue is a requisite for moral standard.	61.6% (121)	20.7% (35)	7.7% (13)	3.93	1.03
5.	My learning experiences at SSU are based on knowledge, skills and rigorous academic activities.	91.1% (154)	7.1% (12)	1.8% (3)	4.28	0.67
<b>Total</b>		<b>415.4</b>	<b>50.3</b>	<b>24.3</b>	<b>21.1</b>	<b>4.15</b>
<b>Total Number of Items</b>		<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>
<b>Mean</b>		<b>83.08</b>	<b>10.06</b>	<b>8.1</b>	<b>4.22</b>	<b>0.83</b>

**Progressivist View (PROGV)**

There are five items designed to measure Progressivist view as part of educational philosophies in relation to curriculum and instruction specifically towards educational system in promoting intellectual virtues and moral values. Majority of the respondents (n=153, 90.6%) strongly believed that the academic programme at Sokoto State University (SSU) served as a guided experience for them while just only 3 (1.8%) disagreed with this (M=4.18, SD= 0.64). Similarly, a total number of 130 (76.9%) respondents strongly believed that they used to partake in different academic and non-academic programmes and activities at SSU which help them to acquire different skills and experiences. However, a few numbers of respondents (n=20, 11.8%) disagreed with this (M=3.88, SD=1.08). Onwards, many of the respondents (n=135, 79.9%) strongly indicated that their learning experience at SSU develops them in a holistic way specifically towards using logical and rational ideas in addressing multifarious societal problem (M=3.88, SD=0.93). Nonetheless, only 10 (5.9%) respondents disagreed with the statement while 24 (14.2%) said that they were neutral. More so, majority of the respondents (n=133, 78.7%) strongly believed that their involvement in collaborative discussion with their colleagues encourage them to be more active in learning (M=5.57, 7.45) while just only 17 (13.0%) disagreed with this; also, a total number of 116 (80.5%) respondents strongly indicated that they are used to use a trial-and-error technique in order to filter ideas that can be useful to solve societal problems. Just only 14 (8.3%) disagreed while 19 (11.2%) maintained neutrality (M=4.08, SD=0.85). Table 4 explains frequencies and percentages on Students’ Responses on Progressivist View (PROGV):

**Table 4:** Students’ Responses on Progressivist View

S/N	Items	Strongly Agree & Agree	Neutral	Strongly Disagree & Disagree	Mean	Standard Deviation
1.	The academic programme of my university serves as a guided experience for me.	90.6% (153)	7.7% (13)	1.8% (3)	4.18	0.64
2.	I used to involve in many programmes and activities on campus which help me acquire different experience.	76.9% (130)	11.2% (19)	11.8% (20)	3.88	1.08
3.	My learning experience at SSU develops me in a holistic way especially in using logical and rational ideas in addressing many issues.	79.9% (135)	14.2% (24)	5.9% (10)	3.88	0.93
4.	I involve myself in discussion among my friends in order to become an active learner rather than passive learner.	78.7% (133)	11.2% (19)	13.0% (17)	5.57	7.45
5.	I like to use a trial-and-error technique in order to determine useful ideas that can be applied to solve different societal problems.	80.5% (116)	11.2% (19)	8.3% (14)	4.08	0.85
<b>Total</b>		<b>406.6</b>	<b>44.3</b>	<b>40.8</b>	<b>21.59</b>	<b>10.95</b>
<b>Total Number of Items</b>		<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>

<b>Mean</b>	<b>81.3</b>	<b>8.86</b>	<b>8.16</b>	<b>4.318</b>	<b>2.19</b>
-------------	-------------	-------------	-------------	--------------	-------------

**Reconstructionist/ Critical Theorist View (RCTV)**

There are five items designed to measure students' perceptions on Reconstructionist/Critical theorist view. Various responses were obtained from the respondents. A total number of 134 (79.3%) strongly believed that higher educational system should be used to address social problems in the country (M=4.23, SD=0.93). Nevertheless, just only 12 (7.1%) of the respondents disagreed with the statement; as part of an attempt to make educational system functional in addressing social problems, majority of the respondents (n=146, 86.4%) strongly believed that they will use their knowledge, education and experience in helping the poor and the oppressed people in the society specifically towards promoting human progress (M=4.25, SD=1.063). Also, the total number of 141 (83.4%) respondents strongly indicated that they always like to maintain social justice specifically in order to promote human progress (M=5.81, SD=7.39). Justly only 9 (5.4%) of respondents disagreed on the statement. Moreover, a number of respondents (n=137, 81.1%) agreed that the current curriculum practices they are going through tend to promote social reform specifically with the integration of technology for the beneficent society (M=5.31, SD=7.48). Nonetheless, just only 13 (7.7%) disagreed with the statement while 19 (11.2%) maintained neutrality in this regard. Table 5 explains frequencies and percentages on Students' Responses on Reconstructionist/Critical Theorist View (RCTV):

**Table 5: Students' Responses on Reconstructionist/Critical Theorist View**

S/N	Items	Strongly Agree & Agree	Neutral	Strongly Disagree & Disagree	Mean	Standard Deviation
1.	I believe that education should address social problems.	79.3% (134)	13.6% (23)	7.1% (12)	4.23	0.93
2.	I will use my knowledge and education to help the oppressed and poor people in the society in order to promote moral standards.	86.4% (146)	5.9% (10)	7.7% (13)	4.25	1.06
3.	I always like to maintain social justice in order to promote human progress.	83.4% (141)	11.2% (19)	5.4% (9)	5.81	7.39
4.	I believe that a better society must be created in order to promote peaceful coexistence within the society.	92.3% (156)	5.9% (10)	1.8% (3)	4.47	0.69
5.	I pass through a curriculum promotes social reform with the use of technology for beneficent society.	81.1% (137)	11.2% (19)	7.7% (13)	5.31	7.48
<b>Total</b>		<b>422.5</b>	<b>47.8</b>	<b>29.7</b>	<b>24.07</b>	<b>17.55</b>
<b>Total Number of Items</b>		<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>
<b>Mean</b>		<b>84.5</b>	<b>9.56</b>	<b>5.94</b>	<b>4.81</b>	<b>3.51</b>



## **Discussion of Findings**

The section presents the discussion of overall findings of this study in relation with dimensions of educational philosophies towards implementation of curriculum in activating intellectual virtues and inculcating moral values among the faculty of education students, Sokoto State University (SSU), Nigeria. This is done in making education an effective mechanism to address multifarious problems such as tribalism, violence, etc. in the society. The components of educational philosophies investigated in this study are: Perennialism, Essentialism, Progressivism, Reconstructionism/ critical theory. Each of these components of educational philosophies are explicitly elucidated in the subsequent paragraphs.

First, based on the findings of this study, majority of the respondents with an aggregate of ( $M=76.22$ ,  $SD=0.95$ ) strongly indicated that the perennialist school of thought has great ideas that can foster their overall intellectual virtues and moral values. Perennialism is a school of philosophical thought that Robert Maynard Hutchins and Mortimer Adler play paramount contributions on its advocacy which has a great influence on educational thought (Amaele, 2005). Undoubtedly, in line with the finding of this research, Perennialists are of the view that human beings are created and endowed with reasoning or rational faculties; hence the intellectual development of learners must be cultivated in order to activate the potentials of the learners. Thereby, this is in agreement previous studies that said it is important for the school to provide proper training to the intellect as well as proper discipline for the mental development of learners and foster their performance (Kaygin, Yilmaz and Semerci, 2017; Kozikoğlu and Uygün, 2018). It is further asserted that the intellectual profundity of the western civilization is very rich; as a result of this richness, it is important to acquire understanding about the great ideas embodied in this heritage with the prime aim of addressing multifarious societal problems especially in Nigeria. Nonetheless, literature posits that Nigerian educational system faces challenges in achieving this (Ekefre, 2014; Muhammadipouya and Mohammadipouya, 2019). Contrarily, the study by Onwudinjo (2023) stressed on the significance of indigenous philosophy and civilization rather than western civilization. In order to achieve this, Perennialists strongly uphold that “permanent studies” such as reading, grammatical rules, logic, rhetoric, logic etc. should form the basis of curriculum design or academic programme in any educational institution in meeting the demands of 21st century (De Guzman, 2022). However, with the educational philosophical viewpoints of Perennialists, by implication, the content selection in the curriculum design plays a paramount role than the needs, interests and abilities of learners as literature contends (Adirika, Okonkwo and Onyebuchi, 2017). It is not arguable to posit that the “permanent studies” are contained in the new curriculum in Nigeria by the National Educational Research Development Council (NERDC); however, the shortcoming is ascribed with the lack of proper implementation of the said curriculum in various levels of education in the country (Omosewo, & Akanmu, 2013).

Second, according to students’ responses, the total aggregate of agreement ( $M=83.08$ ,  $SD=0.83$ ) showed that the essentialist view provides them with ideas on significance of knowledge and rigorous academic programme in enhancing their skills and competences. Essentialism is a philosophical school of thought whose advocates among others are: James D. Koerner, Rickover, and Paul Copperman. It is posited that, accumulated wisdom of elderly people in the society should be transmitted to the younger generation

in order to make use of, adopt and adapt this accumulated wisdom for the continuity and survival or their existence as well as to make progress in all spheres of society. As an integral part of philosophical thought that shapes educational system, majority of the respondents agreed with the assertion of essentialists that systematic way of imparting knowledge is very important to be used as a technique of transmitting the values and virtues of the past generation unto the younger generation. This is why literature posits that, in using the systematic approach in imparting knowledge, the sole objectives among others are to achieve students' intellectual and moral developments through teaching of various subjects like grammar, literature, mathematics, sciences, history, and foreign languages (Idogho, 2016). Indeed, it is the aforementioned two essential factors- intellectual and moral standards- that can make the students useful or valuable members of the society. In other words, in order to attain the students' intellectual and moral standard, an emphasis should be made on the knowledge, skills and rigorous academic engagement by the learners in various higher institutions in the country (Scholar, 2011). These three compartmentalized factors namely knowledge, skills and rigorous academic engagement should be regarded as organized body of knowledge in order to give purposeful shape to the learning experience among the learners in the higher institutions of learning in the country in general and Sokoto State University in particular. According to the essentialists, the training of intellectual is very essential. Therefore, content selection is important in this regard in order to train the intellect. Of such important subjects that should reflect in the content selection an important element of curriculum design is: grammar, literature, sciences, mathematics, foreign language, mother tongue, writing, etc (Idogho, 2016). Similarly, essentialists are also of the view that it is paramount to make an emphasis on the reading, writing, computing etc. which must be based on the clear ideas of what to do and what should be done must be logically done and presented. Just like perennialists, essentialists do not take needs, interests and abilities of the learners into account while designing educational curriculum (Adirika, Okonkwo and Onyebuchi, 2017).

Third, the respondents asserted that progressivist view provides them with the importance of learning environment in developing them holistically with specific focus on logical and rational ideas with total aggregate of agreement ( $M=81.3$ ,  $SD=2.19$ ). Progressivism is another school of thought that its major exponent was John Dewey whose educational ideas shaped American education between mid-1920s and mid-1950s. It is asserted that the primary goal of education should focus on the development of child personality in a holistic way. This holistic development should encompass intellectual, moral, emotional, social and physical aspects. Curriculum, according to progressivists, should serve as a "guided experience" as literature contends (Hansen, 2019). Indeed, various academic and non-academic programmes of various institutions of higher learning in the country in general and Sokoto State University (SSU) in particular should be an embodiment of different activities which will form students' 'learning experience'. The students' ideas should serve as the basis for this learning experience. These ideas according to progressivists should be tested through active experimentation. In the use of experimentation in testing ideas, learners will become active rather than being passive (De Guzman, 2022). Inferably, in testing students' ideas through experimentation, trial and error technique should be employed in order to determine useful ideas that can be used to solve societal problems. Since learners are thinkers, hence, rational and logical ideas emanating from them should be meticulously examined in order to solve multifarious societal problems (Hansen, 2019). In addition, as a result of the fact that

learners have the ability to think and reason, their thinking and reasoning ability should be developed in such a way that they will make use of meaning derived from their learning experience (Onwudinjo, 2023). Undoubtedly, this ‘learning experience’ or ‘guided experience’ should be a central focus of curriculum design which expectedly, should be the basis from questions that arise from the learners’ real-life experience. It is not arguable to posit that there is a gap between curriculum design in various higher institutions and the experience of real life that the students experience. Hence, this gap should be bridged according to the stance of progressivist school of thought which is in line with the responses received from the students at SSU. It is henceforth asserted that various life experiences, students’ confusions and ambiguities should be systematically studied using scientific method of inquiry; nevertheless, systematic study of various societal problems must be under the adequate guidance of the school setting (Kaygin, Yilmaz and Semerci, 2017; Kozikoğlu and Uygun, 2018).

Fourth, the respondents posited that, Reconstructionist/Critical Theorist View has provided them with great educational and philosophical ideas towards social reform in order to achieve beneficent society which has been reflected in  $M=84.5$ ,  $SD=3.51$ ). In this part, based on the views of the respondents, two philosophical schools of thought will be explicated namely: Reconstructionism and critical theory. These two philosophical schools of thought are similar and they have significant impact on educational system or educational policy and curriculum design. On one hand, one of prominent exponent of reconstructionism school of philosophical ideas is Theodore (1904-1987). Basically, reconstructionism is considered as a reaction against economic exploitation and political subjugation of the Second World War. Since the problem of inequality preoccupied the main problem of the World War II, therefore, reconstructionist attempt to address multifarious social problems (Adirika, Okonkwo and Onyebuchi, 2017). Inferably, the respondents asserted that, Reconstructionist focuses on how to create a better society, to maintain social justice as well as freedom which are an integral part of modern democratic principles. Hence, reconstructionist emphatically stresses on the social reform which should explicitly reflected in the curriculum design or academic programme of various institutions of learning (Alemdar and Aytac, 2022). In addition, it is reiterated that, it is important that curriculum integrates both technology and human compassion in order to create an egalitarian and beneficent society. Literature posits that education thereby is regarded as a way of establishing new social order that cater for all instead of elevating the people of affluence in the high-status position within the society (Sidorkin, 1999). On the other hand, critical theorists emphatically stress on the need to make a change within the society in order to ensure that oppression is overcome. The prime motive of overcoming oppression is to improve conditions of every citizen in the society. Indeed, one of prominent critical theorists, Paulo Freire (1921-1997) whose poor background shaped his thinking and ideas towards addressing social problems. It was asserted that, education should improve the level of literacy in a particular nation. In so doing, when the level of literacy is improved, it will serve as a mechanism for making a social change that will activate the sense of human progress consciousness among SSU students and consequently, it will improve the condition of every citizen in the country. Inferably, education and literacy and more importantly teaching and learning process should be considered as an inquiry rather than predominant traditional pedagogical instructional strategy known as a teacher-centered if curriculum and instruction should be intellectually-based with specific focus on intellectual role of the university. In doing so, the sense of inventing and re-inventing the world should be activated in learners with the

prime objective of making social change and overcoming oppression in the society. Hence, curriculum design in various higher institutions of learning should enhance students' experience with specific focus on the social actions or real-life problems. Of such real contemporary societal problems to be addressed are: inequality, poverty, terrorism, violence, among others (Aboluwodi, 2011; Olanrewaju, 2012; Igwe, Rufai and Olufemi, 2013; Irabor, Ola-Obitusin and Olufowobi, 2020).

The foregoing elucidation on essential dimensions of educational philosophies should be utilized as essential educational discoveries as expounded in the literature (Mortimer, 1990) which is the essence of education that various institutions of learning in the country should promote. It is integrally important that pedagogical strategy is important by activating reasoning ability of learners as literature expounds (Shor and Frire, 1987; Web, 2002; Renshaw, 2004; Wegerif, 2007). In so doing, the cardinal components of educational philosophies should promote communities through learning and meaning and consequently their personal and tribal identities should be safeguarded. This is why several studies such as Wenger (1998) emphatically stress on the communities of practice through compartmentalization of learning, meaning and identity (LMI). This could be achieved through practical teaching as study by Wilson (2009) asserts as well as collaborative or cooperative learning among the students (Rogoff, Matusov and White, 1996; Rogoff, Turkanis and Bartlett, 2001). Previous studies have shown that education should foster holistic personality of students through dialogue (Sidorkin, 1991; Skidmore, 2000; Simon, Erduran and Osborne, 2006). In achieving the foregoing explanation, educational philosophies should be used as a mechanism. Therefore, there is a need for curriculum innovation as expounded in the literature (Mkpa & Izuagba, 2003; Yunusa, 2008; Hanna, 2012) in order to address issues in curriculum and instruction specifically towards activating intellectual virtues, creative potentials and skills as well as inculcating or nurturing moral values among the learners within the university and by extension for the betterment of the society.

## **Conclusion and Recommendations**

Basically, the primary objective of this study was to investigate the perceptions of Faculty of Education Students at Sokoto State University (SSU) on the components of educational philosophies as an integral part of Curriculum and Instruction course. It was found out that, the majority of faculty of education students strongly believed that their views on perennialist philosophical school of thought foster their reasoning ability and rational faculty especially in enhancing their intellectual virtues and moral standards within the university community and in the larger society. In addition, the findings have shown that the majority of respondents strongly indicated that, academic programme of higher institution in Nigeria in general and Sokoto State University (SSU) in particular should promote the transmission of accumulated wisdom of past intellectual heritage to the younger generation which is one of major components of essentialist philosophical ideas. Furthermore, a guided experience, acquisition of skills and experiences are emphatically stressed by Progressivist philosophical ideas, as shown in the findings, majority of the respondents asserted that they strongly believed that, the academic and non-academic programmes of SSU used to develop them holistically with specifically towards using logical and rational ideas in solving different problems in the society. Similarly, based on the findings of the study, majority of the respondents strongly believed that, they wish to utilize their knowledge and experience in helping the oppressed people in the society

which is an integral component of Reconstructionist/Critical theorist view. It is thereby recommended that various components should be integrated into academic programmes of the Faculty of Education, Sokoto State University (SSU). Similarly, students' needs, interests and capacities should be taken into consideration rather than an emphasis on the content (curriculum). The following recommendations are therefore made:

- I. The highlighted dimensions should be harmonized with the Nigerian Educational Philosophy as embodied in the National Policy on Education (NPE) that emphatically stress on the promotion, progress and activation of individuals' creative potentials and skills to achieve overall development in the country.
- II. Rational thinking and logical argument are pertinent to be stressed in order to activate intellectual virtues and moral values in the academic programmes of higher institutions in the country in general and Sokoto State University in particular.
- III. Education and pedagogy should be practicable as instruments for learners' development and overall social reconstruction in the country.
- IV. Various components of educational philosophies should be regarded as the foundation Curriculum design, curriculum orientations and autonomy in Nigerian tertiary institutions.

## References

- Aboluwodi, A. (2011). Education for social reconstruction: Implication for sustainable development in Nigeria. *International Journal of Humanities and Social Science*, 1(21), 84-91.
- Adirika, B. N., Okonkwo, C. O., & Onyebuchi, G. C. (2017). Curriculum and essentialism through the eyes of educationists: Implications for Nigeria. *World Wide Journal of Multidisciplinary Research and Development*, 3 (9), 108-111.
- Akomolafe, M. A. M. A. (2020). Between Perennialism and Progressivism: A Reflection on a Pedagogical Choice for Effective Child Development. *Filosofiya osvity. Philosophy of Education*, 26(2), 78-89.
- Alemdar, M., & Aytac, A. (2022). The Impact of Teachers' Educational Philosophy Tendencies on Their Curriculum Autonomy. *Journal of Pedagogical Research*, 6(1), 270-284.
- Amaele, S. (2005). *Understanding the Philosophy of Education*. 2<sup>nd</sup> edition. Ibadan: Nigeria.
- Creswell, J.W. (2014). *Educational research: Planning, conducting and evaluating quantitative and qualitative research*. (4<sup>th</sup> edn). London: United Kingdom.



- De Guzman, E. V. (2022). Perennial-progressivism—P2: an avant-garde cross breed philosophy of education for the 21st century. *Filosofiya osvity. Philosophy of Education*, 28(2), 214-229.
- Ekefre, E. N. (2014). Philosophical Foundation of Curriculum Development in Nigeria: The Essencist Model. *Philosophy*.
- Ezewu, E.E. (1993). *Philosophy of Education*. Ugheli, Eddy-Joe Publishers.
- Hanna, O. Y. (2012). *Fundamentals of Curriculum and Instruction*. Kaduana: Nigeria.
- Hansen, D. T. (Ed.). (2019). *Ethical visions of education: Philosophies in practice*. Teachers College Press.
- Idogho, J. A. (2016). Towards a student-centred learning in Nigerian schools: Drama-in-education and progressive pedagogy. *Creative Artist: A Journal of Theatre and Media Studies*, 10(1), 38-65.
- Igwe, R. O., Rufai, S. A., & Olufemi, A. G. (2013). Social reconstruction through Religious Education: A survey on Nigeria. *Humanity & Social Sciences Journal*, 8(1), 10-18.
- Irabor, B. P., Ola-Obitusin, D. G., & Olufowobi, O. O. (2020). Humanism and Educational reconstructionism in the pedagogy of tai solarin. *J Appl Philos*, 18.
- Karaduman, B. E. T. Ü. L., & Ucar, S. E. D. A. T. (2020). An Investigation on Curriculum Orientations and Educational Philosophies of Pre-Service Teachers. *Necatibey Faculty of Education Electronic Journal of Science & Mathematics Education*, 14(2).
- Kaygin, H., Yilmaz, E., & Semerci, Ç. (2017). The Relation between Lifelong Learning Tendency and Educational Philosophies. *Universal Journal of Educational Research*, 6 (n12A), 121-125.
- Kozikoğlu, İ., & Uygun, N. (2018). Investigation of the relationship between teachers' philosophies of education beliefs and curriculum design approaches. *Cukurova University Faculty of Education Journal*, 47(2), 411-438.
- Mkpa, M.A. and Izuagba, A.C. (2003). *Curriculum Studies and Innovation*. Owerri: Book- Konzulk.
- Mortimer, J.A. (1990). The Paideia Proposal: Rediscovering the Essence of Education. *The American School Board Journal*, pp.88-97.
- Muhammadipouya, F., & Mohammadipouya, S. (2019). The relationship between epistemological beliefs and educational philosophies with teacher/students' teaching approaches. *Research in Teaching*, 7(3), 51-29.



- Olanrewaju, J. S. (2012). Aristotles' Ethics as A Paradigm of Education for Social Reconstruction in Nigeria. *Nigerian Journal of Education Philosophy*, 23(2).
- Omosewo, O.E and Akanmu, M.A. (2013). Evolution of Functional Basic and Senior Secondary Education Curriculum in Nigeria: Implications for Effective Implementation. *Journal of Education and Practice*, vol.4, No.22, 73-80.
- Onwudinjo, A. (2023). Towards An Indigenous Philosophy of Education for Nigeria. *AKU: An African Journal of Contemporary Research*, 4(4).
- Oroka, O. (1990). *The Philosophy of Education: An Introduction*. Warri: International Publishers.
- Pallant, J. (2011). *SPSS survival manual: A step-by-step guide to data analysis using SPSS for Windows (Version 10)*. Open University Press: Chicago, Illinois: USA.
- Renshaw, P. (2004). Dialogic learning, teaching and instruction: Theoretical roots and Analytical frameworks. In J. L. v. d. Linden & P. Renshaw (Eds.), *Dialogic learning: Shifting perspectives to learning, instruction, and teaching* (pp. 1-15). Boston: Kluwer Academic Publishers.
- Rogoff, B., Matusov, E., & White, C. (1996). Models of teaching and learning: Participation in a community of learners. In D. R. Olson & N. Torrance (Eds.), *The handbook of education and human development: New models of learning, teaching and schooling*. (pp. 388-414). Malden, MA, US: Blackwell Publishers Inc.
- Rogoff, B., Turkkanis, C. G., & Bartlett, L. (Eds.). (2001). *Learning together: Children and adults in a school community*. New York: Oxford University Press.
- Scholar, D. A. Y. A. I. (2011). Understanding essentialism as fundamental: The centered African perspective on the nature of prototypical human nature: Cosmological Ka (spirit). *The Western Journal of Black Studies*, 35(2), 77.
- Shor, I., & Freire, P. (1987b). What is the dialogical method of teaching? *Journal of Education*, 169(3), pp. 11-31.
- Sidorkin, A. M. (1999). *Beyond discourse: Education, the self, and dialogue*. Albany, NY: State University of New York Press.
- Simon, S., Erduran, S., & Osborne, J. (2006). Learning to teach argumentation: Research and development in the science classroom *International Journal of Science Education*, 28 (2 & 3), pp. 235-260.
- Skidmore, D. (2000). From pedagogical dialogue to dialogical pedagogy. *Language and Education*, 14(4), pp. 283-296.

- Webb, M. (2002). Pedagogical reasoning: Issues and solutions for the teaching and learning of ICT in secondary schools. *Education and Information Technologies*. Kluwer Academic publishers, 7(3), pp. 237-255.
- Wegerif, R. (2007). *Dialogic, educational and technology: Expanding the space of learning*. New York: Springer-Verlag.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, UK: Cambridge University Press.
- Wilson, L. (2009). *Practical teaching: A Guide to PTTLLA & DTLLS* (Andover, Cengage Learning EMEA.
- Yunusa Ben, M. (2008). *Issues on Curriculum*. Zaria Yag Enterprises: Nigeria.

## INCORPORATING ENTREPRENEURSHIP EDUCATION IN EDUCATIONAL MANAGEMENT CURRICULAR IN UNIVERSITIES FOR JOB CREATION AND SELF RELIANCE IN NIGERIA

<sup>1</sup>\*Sa'adu Isa Bashar and <sup>2</sup>Sambo Zayyanu

<sup>1</sup>\*Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University, Sokoto  
Email: [mmbashar1984@gmail.com](mailto:mmbashar1984@gmail.com)

<sup>2</sup>School of Education,  
Shehu Shagari College of Education, Sokoto, Nigeria  
Email: [sambozayyanu3@gmail.com](mailto:sambozayyanu3@gmail.com)

---

### Abstract

*Nigeria faces a lot of unemployment challenges which contribute significantly in the hike of insecurity and insurgency problems in every nook and cranny of the country. This might not be unconnected to the yearly turnout of hundreds of thousands of graduates being produced by educational institutions across the country that could not be absorbed in the labour market. This paper highlights the need for integrating entrepreneurship education in the curricular of Educational Management in Universities to prepare Educational Management students for self-employment and reduce over dependence on government jobs. To this end, the paper after conceptual clarifications, examines the factors that are responsible for unemployment in Nigeria such as population growth, skills mismatch, insecurity and social instability, among others. Further, the paper highlights the relevance of integrating entrepreneurship education in Educational Management such as enhancing employability, self-employment and fostering innovations. Skills in entrepreneurship education were also examined in the paper as well as challenges bedevilling the integration of entrepreneurship education in Educational Management curriculum. The paper concludes that incorporating entrepreneurship education in educational management curricular in universities helps in making graduates job creators instead of job seekers. Based on this, the paper suggests the need for adopting strategies such as curriculum review, teacher training, collaboration and partnerships, experiential learning, establishment of entrepreneurship clubs and competitions, in order to ensure effective integration of entrepreneurship education in Educational Management curriculum for job creation and self-reliance.*

**Keywords:** Entrepreneurship Education, Educational Management, University, Job Creation, Self-reliance

### Introduction

Nigeria faces a lot of unemployment crisis which has contributed significantly in the hike of insecurity and insurgency problems in every nook and cranny of the country. The National Bureau of Statistics (NBS, 2022) reported that the unemployment rate in the country, has in the fourth quarter of 2022 reached a staggering percentage of 33.3%. This

might not be unconnected with the yearly turnout of hundreds of thousands of graduates being produced by educational institutions across the country that could not be absorbed in the labour market. This might be due to lack of provision for employment by the government, inadequacy of the job opportunities or other reasons. Thus, if this trend is not overcome, unemployment will continue to threaten the peaceful existence of Nigeria as a nation. Based on this, students of Educational management in universities need to be exposed to entrepreneurial skills through entrepreneurship education in order to prepare them for self-employment and job creation because, entrepreneurship education has the potentials of equipping individuals with knowledge, skills, and mind-sets that are necessary for initiating businesses and creating job opportunities for self-reliance. Therefore, integrating entrepreneurship education in the context of Educational management as a programme of study can help empower students with entrepreneurial skills while also fostering innovation within the field. The main thrust of this paper is to advocate for integrating entrepreneurship education in the curricular of Educational management in order to prepare the students for self-employment and reduce over dependence on government for job. To this end, the paper after conceptual clarifications, explained the factors that are responsible for unemployment in Nigeria. Further, the paper highlights the need for integrating entrepreneurship education in Educational management, justifies the skills in entrepreneurship education, and challenges of integrating entrepreneurship education in Educational management curriculum. Finally, recommended strategies for integrating entrepreneurship education in Educational management curricular were justified and conclusion was drawn for consideration.

### **Conceptual Clarifications**

Entrepreneurship Education has been defined by Hisrich, Peters, and Shepherd (2017), as an educational approach that aims to equip individuals with the knowledge, mind-set, and abilities needed to become successful entrepreneurs. By providing theoretical knowledge, practical training, and experiential learning opportunities, entrepreneurship education empowers students and aspiring entrepreneurs to take initiative, think critically, and take calculated risks in the business world.

Educational management refers to the administration, organization, planning, and coordination of educational institutions such as schools, colleges, and universities. It encompasses various aspects such as budgeting, staffing, curriculum development, policy implementation, and overall improvement of educational outcomes. According to Bush and Middlewood (2013), educational management deals significantly with issues related to effective operations of schools and colleges which involve the application of managerial principles, techniques, and strategies to achieve goals and objectives in an educational setting. In essence, educational management focuses on providing a conducive learning environment, both physical and psychological, for students and ensuring that the institution operates efficiently and effectively. Furthermore, educational management involves leadership and decision-making skills. Thus, educational managers are responsible for guiding and motivating teachers and staff, as well as making informed decisions related to curriculum, resources, and policies.

Job creation has been defined by ILO (2012) as the process of generating new employment opportunities within an economy or a specific organization. It involves the establishment of positions or roles that individuals can engage in to earn income and

contribute to the overall workforce. Job creation is a crucial aspect of economic development and is often seen as a measure of the health and vitality of an economy (European Commission, 2013).

Self-reliance, on the other hand, refers to the ability of individuals, communities, or nations to meet their own needs, either through independent efforts or by reducing dependence on external support (UNCTAD, 2016). It involves developing skills, resources, and systems that enable individuals or groups to be economically and socially self-sufficient (Lutzenhiser, 1993).

### **Factors Responsible for Unemployment in Nigeria**

In Nigeria, several factors were responsible for unemployment. These include:

- I. **Rapid population growth.** Nigeria has experienced significant population growth over the years, which has resulted in increased competition for limited job opportunities. According to the National Population Commission of Nigeria, the population is projected to reach 398 million by 2050, creating immense pressure on employment generation (National Population Commission, 2018). Okeke, Odo and Ideh, (2019) further lamented that the country's workforce is expanding at a faster rate than the available job opportunities, leading to a substantial gap between the number of job seekers and the vacancies available.
- II. **Insufficient infrastructure.** Inadequate infrastructure, including power supply, transportation networks, and water supply, poses a significant challenge to job creation and self-reliance. The manufacturing and service sectors are particularly affected by unreliable power supply, leading to reduced productivity and constrained growth (Adeyemi, 2020).
- III. **Skill gaps and mismatch.** It has been observed that there is a significant mismatch between the skills possessed by job seekers (school graduates) and the skills required by employers, contributing to high unemployment rates. Oluwatobi, Efobi and Olurinola, (2015) contends that there is mismatch between the skills possessed by job seekers and the skills required by available job opportunities. Nigeria's education system faces challenges in equipping graduates with the practical skills and employability competencies demanded by the labour market. As a result, many graduates struggle to find suitable employment despite having academic qualifications. The World Bank reports that Nigeria faces challenges in providing relevant and quality education and fostering the necessary skills for employability (World Bank, 2020).
- IV. **Limited access to finance.** Many aspiring entrepreneurs and small businesses in Nigeria face difficulties accessing affordable and adequate financing options. This lack of access to capital hampers the establishment and expansion of businesses, hindering job creation and self-reliance (Ajefu, 2020).
- V. **Inadequate policy implementation.** Systemic challenges related to policy implementation, corruption, and bureaucratic inefficiencies impact Nigeria's job creation efforts. Despite the presence of policies aimed at fostering economic development and employment, successful implementation remains a major challenge (Adeleye & Conroy, 2020).

- VI. Insecurity and social instability. Nigeria has faced security challenges, including insurgency, terrorism, and communal conflicts, particularly in certain regions. These security concerns deter investment, disrupt economic activities, and hamper job creation efforts (United Nations Development Program, 2020).
- VII. Country's overdependence on oil as its primary source of revenue has contributed to the unemployment crisis. The volatility of the oil industry, coupled with insufficient diversification of the economy, has limited job creation in other sectors (Akpanung & Effiong, 2021). This leaves many job seekers with limited options and exacerbates the unemployment problem.

### **Sacrosanctity of Integrating Entrepreneurship Education in Educational Management**

Integrating entrepreneurship education in the context of Educational management in Nigeria has a multitude of benefits. This is because, several studies attested to this fact. For example, a study by Fayolle and Liñán (2014) found that entrepreneurship education positively influences entrepreneurial attitudes, intentions, and self-confidence. Another study by Hatak, (2015) demonstrated that such education can enhance entrepreneurial self-efficacy, entrepreneurial alertness, and entrepreneurial intentions of individuals. Here are some specific benefits of integrating entrepreneurship education in Educational management:

- I. Enhancing employability. Incorporating entrepreneurship education in Educational management equips students with transferrable skills such as critical thinking, problem-solving, and creativity, making them more desirable candidates in the job market (OECD, 2016).
- II. Fostering innovation. By intertwining Educational management with entrepreneurship, students are encouraged to think outside the box, identify opportunities, and create innovative solutions that could address the societal needs (Fayolle & Liñán, 2014).
- III. Encouraging self-employment. Entrepreneurship education empowers students to pursue self-employment opportunities by leveraging their knowledge of Educational management. This can lead to the creation of new businesses, contributing to economic growth and reducing unemployment rates (Henry, Hill & Leitch, 2005).
- IV. Developing business acumen. Integrating entrepreneurship education helps students understand the core principles of business management, including financial literacy, marketing strategies, and organizational skills. This knowledge equips them with a solid foundation for successfully running their own Educational management-related businesses (Fayolle & Liñán, 2014).
- V. Promoting social impact. By combining Educational management with entrepreneurship, students can identify ways to address environmental or health-related challenges through entrepreneurial initiatives. This can lead to the development of sustainable solutions that benefit society (Pittaway & Cope, 2007).



## **Skills Obtainable in Entrepreneurship Education**

According to Hisrich, Peters, and Shepherd (2017), Kuratko, (2017), as well as Shane and Venkataraman. (2000), entrepreneurship education equips students with entrepreneurship skills. Entrepreneurship skills are the set of abilities, knowledge, and competencies possessed by individuals to identify, assess, and exploit business opportunities effectively, while also managing risks and uncertainties to create value and ensure the success of their ventures. These skills are essential for entrepreneurs to navigate the complex and dynamic world of business. Hisrich, Peters, and Shepherd (2017), Kuratko, (2017), and Shane and Venkataraman (2000) maintained that these skills include:

- I. Creativity and Innovation Skills. This is the ability to generate new ideas, think outside the box, and adapt to changing circumstances.
- II. Problem-Solving and Decision-Making Skills. Effective problem-solving skills and the ability to make sound decisions under uncertain and ambiguous conditions.
- III. Persistence and Resilience Skills. The mental fortitude to bounce back from setbacks, overcome obstacles, and maintain focus and motivation.
- IV. Opportunity Recognition. Skill. The skill to identify and spot market gaps, customer needs, and emerging trends that can be turned into viable business opportunities.
- V. Market Research Skill. This is the ability to conduct thorough market analysis, understand customer preferences, and assess potential demand and competition.
- VI. Risk Assessment Skill. Deals with assessing the risks and rewards associated with a business opportunity and making informed judgments to mitigate risks.
- VII. Leadership and Team Building Skills. This is the capacity to inspire, motivate, and lead a team effectively, fostering a collaborative and productive work environment.
- VIII. Financial Management Skill. Deals with the ability to manage financial resources, budgeting, forecasting, and financial planning, including understanding cash flow, profitability, and investment.
- IX. Marketing and Sales Skills. These are the skills related to effectively promoting products or services, understanding target markets, developing marketing strategies, and delivering value to customers.

## ***Challenges of Integrating Entrepreneurship Education in Educational Management***

Scholars such as Odili and Anyanwu (2019), Nwagbara and Ezeh (2017), Obaje and Mbaeke (2020) are of the opinion that integrating entrepreneurship education into the Educational management curricular in Nigeria is an important endeavour that comes with its own set of challenges which could deter effective implementation of the said curriculum. These include:

- I. Lack of awareness and understanding. Many teachers, students, and policymakers may not fully grasp the potential benefits of integrating entrepreneurship education into Educational management. This lack of awareness can hinder the development and implementation of suitable programs and curricula.
- II. Limited resources and infrastructure. Nigeria faces various resource constraints, including inadequate funding, outdated teaching materials, and insufficient technological infrastructure. These limitations can impede the effective integration of entrepreneurship education into the Educational management curriculum.
- III. Teacher training and capacity building. Teachers play a crucial role in delivering entrepreneurship education. However, limited opportunities for professional development and training programs focusing on both entrepreneurship and Educational management can hinder the ability of teachers to effectively deliver high-quality instruction.
- IV. Curriculum design and alignment. Designing a curriculum that seamlessly integrates entrepreneurship with Educational management requires careful planning and collaboration between relevant stakeholders. Balancing the acquisition of management knowledge with entrepreneurial skills can be a complex task that necessitates curriculum redesign and alignment.
- V. Evaluation and assessment. Developing appropriate evaluation and assessment methods to measure the effectiveness of integrating entrepreneurship education in Educational management is challenging. Traditional assessment methods may not capture the full range of entrepreneurial skills that students acquire, making it crucial to develop new assessment approaches tailored to entrepreneurship education.

## **Conclusion**

It is worth concluding that unemployment in Nigeria continues to survive in that government alone cannot provide jobs for all the school graduates. Moreover, this will continue to affect the peaceful existence of the country as a nation until something is put in place such as entrepreneurship education to avoid over dependence on government job. The paper indicated how unemployment in Nigeria is occasioned by factors such as rapid population growth, skills mismatch, and overdependence on oil. To address the problem, there is need for policy makers to integrate entrepreneurship education in all subjects including Educational management so as to prepare students for self-employment and self-reliance after their graduation.

## **Recommendations**

In order to successfully integrate entrepreneurship education into Educational Management curricular in Nigerian universities, there is the need for:

- I. Curriculum Review. The curriculum planners and developers need to ensure that the curriculum for entrepreneurship education in Educational management aligns with national educational standards and includes relevant topics such as business management, marketing, and innovation. This will help students see the practical applications of Educational management in real-world business settings.

- II. **Teacher Training.** Government need to provide specialized training and professional development opportunities for Educational management teachers to enhance their understanding of entrepreneurship concepts and teaching methodologies. This will enable them to effectively deliver entrepreneurship education while maintaining subject expertise.
- III. **Collaboration and Partnerships.** This involves fostering collaborations between Educational management teachers, entrepreneurship educators, and industry professionals. By engaging mentors and experts from various sectors, students can gain practical insights, guidance, and mentorship, enabling them to bridge the gap between Educational management and entrepreneurship.
- IV. **Experiential Learning.** There is need to incorporate hands-on, practical experiences into the curriculum, such as internships, apprenticeships, or project-based learning. This approach helps students apply their Educational management knowledge in entrepreneurial contexts, fostering critical thinking, problem-solving, and innovation skills.
- V. **Access to Resources.** Government needs to ensure access to relevant resources, such as textbooks, online learning platforms, and case studies that link Educational management and entrepreneurship. Additionally, provide adequate facilities and equipment for practical experimentation and application of Educational management concepts in entrepreneurial projects.
- VI. **Entrepreneurship Clubs and Competitions.** There is need to establish entrepreneurship clubs and organize competitions or business pitch events in universities. These activities create platforms for students to develop and showcase their entrepreneurial skills, fostering creativity, teamwork, and leadership abilities.
- VII. **Policy Support.** Advocate for supportive policies from educational authorities and stakeholders. Seek their endorsement and commitment to integrating entrepreneurship education in the Educational management curriculum and allocate adequate resources for training, materials, and infrastructure.
- VIII. **Investing in Vocational Training.** There is a need for prioritizing and investing in quality education and vocational training that align with the skills demanded by the labour market. This would enhance the employability of graduates and reduce the skills gap.
- IX. **Economic diversification.** The government should focus on diversifying the economy, promoting entrepreneurship, and creating an enabling environment for business development.

## References

- Adeleye, O., & Conroy, P.J. (2020). Challenges of policy planning and implementation in Nigeria. *International Journal of Humanities, Art and Social Studies*, 5(3), 10-19.

- Adeyemi, S. L., (2020). Electricity generation and economic growth in Nigeria: Structural breaks, causality, and challenges. *Journal of Public Administration and Governance*, 10(3), 5-22.
- Ajefu, J. B. (2020). Access to credit and small business development in Nigeria. *International Journal of Innovation and Economic Development*, 6(2), 24-34.
- Akpansung, M. B., & Effiong, I. (2021). Oil dependency and unemployment in Nigeria: An empirical study. *Journal of Sustainable Development in Africa*, 23(1), 18-35.
- Bush, T., & Middlewood, D. (2013). *Theories of educational management & leadership: A handbook* (3rd ed.). Sage.
- Fayolle, A., & Liñán, F. (2014). The future of research on entrepreneurial intentions. *Journal of Business Research*, 67(5), 663-666.
- Hatak, I., Harms, R., Fink, M., & Traut-Mattausch, E. (2015). The role of entrepreneurship education on entrepreneurial attitudes and intentions: Outcome-based evaluation of a mature entrepreneurship program. *Journal of Vocational Behavior*, 90, 13-25.
- Henry, C., Hill, F., & Leitch, C. (2005). *Entrepreneurship education and training: Can entrepreneurship be taught?* Part I. *Education + Training*, 47(2), 98-111.
- Hisrich, R., Peters, M., & Shepherd, D. (2017). *Entrepreneurship*. McGraw-Hill Education.
- ILO. (2012). *Decent Work and the Informal Economy*. International Labour Organization.
- Kuratko, D. F. (2017). *Entrepreneurship: Theory, process, and practice*. Cengage Learning.
- Lutzenhiser, L. (1993). Social and behavioural aspects of energy use. *Annual Review of Energy and the Environment*, 18(1), 247-289.
- National Bureau of Statistics (NBS). (2022). Labour Force Statistics: Unemployment and Underemployment Report Q4 2020. Retrieved from <https://nairametrics.com/2021/04/20/full-report-unemployment-rate-in-nigeria-rises>
- National Population Commission. (2018). *Nigeria Demographic and Health Survey 2018*. Retrieved from <https://dhsprogram.com/pubs/pdf/FR359/FR359.pdf>
- Nwagbara, U., & Ezech, D. (2017). Entrepreneurship Education: Imperatives for Nigeria's Education Curriculum. *International Journal of Education and Research*, 5(6), 133-148.
- Obaje, A. R., & Mbaeke, C. E. (2020). Challenges of Embedding Entrepreneurship Education in the Nigerian Education Curriculum. *Journal of Entrepreneurship Education*, 23(3S), 1-14.
- Odili, G. & Anyanwu, E. (2019). Entrepreneurship Education in Nigeria: Challenges and Strategies for Improvement. *Journal of Education, Society, and Behavioural Science*, 32(5), 1-13.

- Okeke, A., Odo, S., & Ideh, V. (2019). Population growth, urbanization, and unemployment in Nigeria. *Global Journal of Social Sciences*, 18(1), 25-34.
- Oluwatobi, S., Efobi, U., & Olurinola, O. (2015). Innovation in Nigeria: Entrepreneurial challenges and the way forward. *African Development Review*, 27(2), 108-120.
- Organisation for Economic Co-operation and Development (OECD). (2016). *Skills for entrepreneurship and innovation*. Retrieved from <https://www.oecd.org/industry/ind/6734118.pdf>
- Pittaway, L., & Cope, J. (2007). Entrepreneurship education: A systematic review of the evidence. *International Small Business Journal*, 25(5), 479-510.
- Salami, O. A., Ikumapayi, O. M., & Oke, R. (2020). Industry-academic collaboration as a panacea for graduate unemployment in Nigeria. *European Journal of Education Studies*, 7(12), 154-165.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-226.
- UNCTAD. (2016). *Towards Sustainable and Resilient Societies: A Toolkit for Self-Reliance*. United Nations Conference on Trade and Development. [Link: [https://unctad.org/system/files/official-document/osg2016d7\\_en.pdf](https://unctad.org/system/files/official-document/osg2016d7_en.pdf)]
- United Nations Development Programme. (2020). *Human Development Indices and Indicators 2018 Statistical Update*. Retrieved from <http://hdr.undp.org/en/indicators/137506>

## THE ROLE OF LIBRARIES IN HARNESSING TECHNOLOGY FOR PROMOTING DIGITAL INCLUSION IN NIGERIA

**Aisha Sadiq Yelwa**

Inuwa Abdulkadir Library,  
Sokoto State University, Sokoto  
Email: [aishanbaba27@gmail.com](mailto:aishanbaba27@gmail.com)

---

### Abstract

*In an era defined by digital advancement, librarians have become pivotal in driving digital inclusion efforts. This paper explores how librarians leverage technology in libraries to bridge the digital divide and empower communities. Librarians provide equitable access to technology infrastructure, offer tailored educational programmes to enhance digital literacy, and collaborate with local entities to address specific community needs. The paper highlights the innovative initiatives undertaken by librarians to promote digital inclusion, such as workshop, user education programme, online training and mobile libraries reaching areas that face challenges in accessing services, including educational and digital resources, due to their distance from urban centers, and collaborations with community centers and educational institutions. By fostering a culture of lifelong learning and digital empowerment, librarians are transforming lives and shaping a more inclusive future for all. The paper concluded that, harnessing technology is essential for promoting digital inclusion, and librarians are at the forefront of this endeavor. Their proactive leadership, expertise, and commitment to equity are instrumental in bridging the digital divide and ensuring that everyone has the opportunity to thrive in the digital age.*

**Keywords:** Digital Inclusion, Digital inclusion and libraries,, digital inclusion and librarians, Nigerian Libraries and Technology

### Introduction

In the contemporary era, digital inclusion is critical for societal progress, impacting education, employment, and overall well-being. Librarians play a pivotal role in promoting digital inclusion within libraries, necessitating suitable IT infrastructure, dedicated staff time, and local authority support (European Commission, 2019). This ensures equitable access to information and communication technologies (ICT), encompassing skills and support for social and economic participation. Beyond organizing books, librarians provide information literacy, integrate technology, and offer lifelong learning opportunities (ACRL, 2020), empowering individuals regardless of background and fostering personal and social advancement (Davis, 2019). This paper seeks to highlight librarians' strategies and initiatives in digital inclusion, acknowledging their pivotal role in fostering inclusive practices. By promoting digital literacy and ensuring equitable access to resources, librarians enhance educational opportunities and social mobility.

Current discussions emphasized the transformative impact of digital technology on learning and access to information, emphasizing the need for inclusive practices in



libraries. Librarians are increasingly recognized not only as custodians of knowledge but also as facilitators of digital literacy and access, crucial in the digital era's evolution. Key challenges include ensuring affordable access, promoting digital literacy, and enhancing the relevance of digital resources for diverse user groups, essential for narrowing the digital divide and maximizing the benefits of digital inclusion for all.

Librarians play a crucial role in advancing digital inclusion by facilitating access to information and technology, thereby empowering individuals and communities. They serve as educators, facilitators, and advocates, bridging the digital divide through various community-driven initiatives. Digital inclusion is essential to ensure that all individuals, regardless of background, have equal opportunities to benefit from the digital age, enabling educational advancement, economic participation, and societal integration. In education, digital inclusion facilitates personalized learning and bridges educational gaps, particularly for underserved communities, promoting equity and mobility (Warschauer & Matuchniak, 2023; OECD, 2020). It enhances library users' access to resources and educational empowerment, reducing disparities (Helsper & Reisdorf, 2017). Librarians adapt to ensure equitable technology access, recognized by the American Library Association (ALA) for promoting digital literacy and bridging divides (ALA, 2023). Librarians lead in digital inclusion, recognizing technology's role in societal empowerment and actively promoting access and participation. The aim of this paper is to examine how librarians can effectively lead initiatives for digital inclusion, leveraging their roles as educators, facilitators, and advocates within their communities. By analyzing successful strategies implemented in various contexts, this paper aims to contribute to broader societal goals of promoting digital equity and inclusion. This paper employs literatures review and analysis of case studies to explore successful strategies implemented by librarians in fostering digital inclusion, thereby contributing to broader societal goals.

### **The concept of digital inclusion**

Digital inclusion refers to ensuring that all individuals and communities, including those traditionally marginalized or underserved, have equitable access to and effective use of information and communication technologies (ICT). This concept encompasses not only physical access to ICT infrastructure and devices but also the skills, knowledge, and support necessary to utilize digital technologies for social and economic participation.

Many experts and scholars have defined digital inclusion. According to the European Commission (2019), digital inclusion involves "the ability of individuals and groups to access and effectively use information and communication technologies (ICT) for a variety of purposes, including education, employment, healthcare, civic engagement, and social interaction." It aims to bridge the digital divide by addressing barriers such as affordability, digital literacy, and the relevance of digital resources. This definition means ensuring that everyone can access and effectively use digital technologies like computers and the internet for activities such as learning, working, healthcare, and staying connected with others.

The World Bank (2021) opined that digital inclusion involves the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and can use information and communication technologies (ICTs). Davis (2021) argued that digital inclusion is about ensuring that all individuals, regardless of their

background, have equal opportunities to access and use digital technologies for personal and professional development. This means making sure that everyone, regardless of their background, has fair opportunities to use digital technologies for personal and professional growth. The American Library Association (ALA) (2023) expressed that digital inclusion encompasses the equitable access to and effective use of information and communication technologies (ICT) by all members of society. The ALA's definition means that digital inclusion ensures all members of society have equal access to and can use digital technologies like computers and the internet.

The International Telecommunication Union (ITU) (2022) also defined digital inclusion as the process of ensuring that all individuals and communities have access to and can use information and communication technologies (ICTs). Warschauer and Matuchniak (2023) described digital inclusion as involving policies and practices aimed at providing individuals and communities with access to digital technologies and the skills to use them effectively for personal and societal advancement. This definition means that digital inclusion involves creating policies and practices that give individuals and communities access to digital technologies and teach them how to use these technologies to improve their lives. The Organisation for Economic Co-operation and Development (OECD) (2023) sees digital inclusion as policies and initiatives that ensure all individuals and groups have access to and can effectively use digital technologies.

### **Libraries and digital inclusion**

Libraries are indeed crucial institutions in promoting digital inclusion due to their historical role as providers of information access and their evolving mandate to ensure equitable access to digital technologies and resources. Libraries facilitate digital inclusion by providing digital information, enabling users to access information remotely regardless of their location. Their responsibilities in this regard are multifaceted.

Libraries play a pivotal role in promoting digital inclusion by serving as community hubs where individuals can access computers, the internet, and digital resources either free of charge or at minimal cost. They offer digital literacy programs and training sessions to help patrons develop essential skills for using digital technologies effectively. These initiatives empower individuals to navigate the digital landscape with confidence, ensuring that everyone can benefit from technological advancements (ALA, 2023). The mandate and responsibilities of libraries, as emphasized by Lloyd (2022), include a strong commitment to providing equitable access to information and technology. This core mission involves advocating for digital literacy and ensuring that all members of society possess the necessary skills and resources to engage with the digital world. Libraries uphold this mandate by continually updating their services and resources to meet the evolving needs of their communities.

Libraries have a significant impact and reach in bridging the digital divide, particularly for underserved communities, including those in rural areas and low-income neighborhoods. They offer a range of programs tailored to diverse user needs, such as job searching, online learning, and accessing government services. By providing these essential services, libraries help to level the playing field, enabling individuals from all backgrounds to participate fully in the digital economy (Davis, 2019). The importance of libraries in promoting digital inclusion is recognized and supported by governments and policymakers. Numerous initiatives and funding programs aim to enhance libraries' capacity to provide digital resources and services to their communities. This recognition

underscores the critical role libraries play in fostering digital equity and inclusion, making them indispensable in efforts to bridge the digital divide (OECD, 2020). Finally, libraries not only have the mandate but also embrace the responsibility to promote digital inclusion. They are essential institutions that actively work to ensure everyone has the skills and access needed to participate fully in the digital age. Through their comprehensive programs and services, libraries continue to uphold their historical role as providers of information access while evolving to meet the digital needs of their communities.

### **The Role of Librarians in promoting digital Inclusion**

Librarians play a crucial role in promoting digital inclusion by providing equitable access to information and technology resources for all members of their communities. Their efforts are instrumental in bridging the digital divide and empowering individuals with the skills and knowledge needed to thrive in the digital age. These efforts could be through the library's website, social media, and printed materials (Pamphlets, posters, and leaflets). Librarians would also integrate digital inclusion into programmes, workshops, and community events, emphasizing their role in providing equitable access to information and technology resources. Collaborations with local organizations and ongoing professional development within the library profession would further reinforce the message of bridging the digital divide and empowering individuals in the digital age.

As stated by Hildreth (2018), libraries provide digital inclusion for all users, regardless of socioeconomic status or geographic location. They assist people in learning to use technology and other web resources. Palfrey (2019), stresses that libraries are essential institutions in the digital age because they promote digital equity. They ensure that everyone, regardless of background or circumstances, has access to the tools and resources they need to succeed in the digital world.

### **Strategies for Promoting Digital Inclusion**

The following are some of the strategies that can be adapted to enable librarians play significant roles in the digital age, and thereby promote digital inclusion in Nigeria.

#### **1. *Providing Access to Technology Infrastructure***

Librarians play a crucial role in providing equitable access to technology infrastructure, including computers, internet, and digital resources. As emphasized by the American Library Association (ALA) (2023), librarians are committed to "providing equitable access to information and technology". Public libraries, in particular, serve as vital centers where individuals can access computers and the internet free of charge. Librarians ensure that these resources are available to all patrons, regardless of their socioeconomic status or technological proficiency. By offering a range of digital devices and software applications, librarians enable individuals to explore and utilize technology to meet their educational, informational, and recreational needs.

#### **2. *Delivering Educational Programmes***

Librarians deliver a diverse array of educational programmes and resources designed to enhance digital literacy skills among patrons. These programmes encompass a wide range of topics, including basic computer skills, internet navigation, online safety, and digital citizenship. As noted by Hirsh (2019), libraries offer "a wealth of educational

opportunities for patrons of all ages," including workshops, training sessions, and one-on-one assistance with digital devices and applications. Librarians tailor these programmes to meet the specific needs and interests of their communities, fostering a culture of lifelong learning and skill development in the digital age.

### **3. *Collaboration for Community Solutions***

Librarians engage in collaborative efforts with local organizations, schools, and government agencies to address community-specific digital inclusion challenges. These partnerships enable librarians to leverage resources, expertise, and networks to develop comprehensive solutions that meet the diverse needs of their communities. As highlighted by the Public Library Association (PLA) (2023), libraries are "partners in community development and public health". Librarians work closely with stakeholders to identify barriers to digital inclusion and co-create initiatives that promote access to technology, digital literacy, and online resources. For example, libraries offer orientation, workshops and exhibition and user education classes (e.g., GST) to teach patrons basic skills, like internet navigation, and e-books surfing, ensuring everyone has the opportunity to participate in the digital world. For instance they offer e-book lending services, allowing patrons to borrow e-books remotely from their own devices, regardless of their socioeconomic status or geographic location.

### **4. *Digital resource management***

Librarians curate digital collections and resources, including e-books, online databases, and multimedia materials, to support patrons' educational and informational needs (Rosenfeld and Morville, 2019). They organize these resources in a user-friendly manner and provide guidance on how to access and utilize them effectively (Armitage and Nasser, 2018), (Fourie, 2019). The librarians organize digital resources in a user-friendly manner, employing classification systems and metadata to facilitate easy navigation and retrieval. They also offer guidance on accessing and utilizing digital resources effectively, assisting patrons in navigating online databases, e-book platforms, and multimedia materials

### **5. *Technology support and assistance***

Librarians offer technology support and assistance to patrons who encounter challenges or have questions related to digital devices, software applications, or online services. They may provide one-on-one assistance, create user guides or tutorials, or offer referral services to other community resources for specialized support (Dempsey and Wilson, 2019). Librarians play a significant role in harnessing technology to empower patrons through tailored educational programmes and innovative initiatives. According to Januszewski, and Molenda (2023) defined Educational technology as the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources. Bates (2019) sees Educational technology as the systematic application of scientific and mathematical principles and practices to the design, development, implementation, and evaluation of teaching and learning activities and resources. It encompasses a wide range of tools, techniques, and strategies aimed at enhancing the educational process through the effective use of technology.

### **6. *Tailored Educational Programmes***

Librarians offer a variety of tailored educational programmes, including workshops, training sessions, and digital collections, designed to meet the diverse needs of patrons.

As Hirsh (2019) notes, libraries provide "a wealth of educational opportunities for patrons of all ages." For example, libraries host computer literacy workshops to teach basic digital skills, internet navigation sessions to promote online proficiency, and coding classes to foster technological fluency. Librarians also provide digital collections comprising e-books, online databases, and educational software, ensuring that patrons have access to high-quality educational resources that cater to their interests and learning objectives.

### **7. Innovative Initiatives**

Librarians spearhead innovative initiatives that leverage educational technology to extend library services beyond traditional boundaries. These initiatives include library of things, digital media, virtual reality and so on. For instance, mobile libraries equipped with Wi-Fi hotspots and laptops bring technology and digital resources directly to underserved communities, overcoming barriers to access and promoting digital inclusion (Todaro, 2019). Additionally, librarians form partnerships with community centers and educational institutions to expand the reach and impact of their educational programmes. Collaborative initiatives such as joint workshops, technology fairs, and digital literacy campaigns harness the collective resources and expertise of diverse stakeholders to address digital divides and promote lifelong learning in the digital age.

### **Expected benefit of digital inclusion in Nigeria**

Librarians' efforts in promoting digital inclusion have far-reaching impacts, fostering lifelong learning and transforming communities. The following are some of the expected benefit of digital inclusion in Nigeria:

- I. **Fostering Lifelong Learning:** Librarians play a pivotal role in fostering a culture of lifelong learning and digital empowerment within their communities. As Todaro (2019) states, libraries serve as "centers for lifelong learning," offering a wide range of educational resources and programmes for patrons of all ages. Through workshops, seminars, and digital literacy classes, librarians empower individuals to acquire new skills, explore diverse interests, and adapt to technological advancements. By providing access to digital resources and technology training, librarians equip patrons with the tools they need to thrive in an increasingly digital world. This emphasis on lifelong learning not only enriches individual lives but also contributes to societal progress and innovation.
- II. **Transforming Communities:** Librarians' efforts have a transformative impact on individuals and communities, promoting social inclusion, economic opportunity, and civic engagement. As revealed by Lloyd (2022), the New York Public Library (NYPL) and the Boston Public Library (BPL) offer free English as a Second Language (ESL) classes to help immigrants and non-native English speakers improve their language skills. They also provide basic computer skills and internet usage classes, job search workshops, and encourage community members to participate actively in local governance and elections. According to the American Library Association (ALA) (2023), libraries are "centers of community engagement," serving as hubs for learning, collaboration, and social interaction. Through their innovative programmes and initiatives, librarians bridge digital divides, empower marginalized populations, and create opportunities for personal and professional growth. By providing access to technology, information, and educational resources, libraries empower individuals to participate fully in the



digital economy and society. Moreover, libraries serve as catalysts for community development, facilitating partnerships and initiatives that address local needs and challenges. By fostering connections and promoting dialogue, librarians strengthen the fabric of communities and contribute to a more equitable and inclusive society.

### **Enhancing digital Economy**

Enhancing the digital economy through digital inclusion in libraries involves empowering these institutions to ensure equitable access to digital resources, fostering digital literacy, and promoting participation in the digital economy. Libraries contribute significantly to this enhancement in several key ways.

One of the primary ways libraries enhance the digital economy is by providing access to digital resources. Libraries offer access to computers, high-speed internet, and digital databases, which are essential for individuals to engage in online activities such as job searches, entrepreneurship, and e-commerce. This access is particularly crucial for those who may not have such resources at home, thereby bridging the gap between different socioeconomic groups and enabling broader participation in the digital economy (Ayob, 2020). In addition to providing access to digital resources, libraries play a critical role in fostering digital literacy. They offer training programs and workshops to teach essential digital skills such as computer basics, internet navigation, software applications, and online safety. These skills are vital for individuals to participate effectively in the digital economy. By equipping people with the necessary knowledge and abilities, libraries help to ensure that everyone can take advantage of digital opportunities (Bawden, 2020). Libraries also support local economic development by providing resources for entrepreneurs and small businesses. This support includes access to business planning tools, market research databases, and workshops on digital marketing and e-commerce strategies. By offering these resources, libraries help entrepreneurs and small businesses to grow and succeed, contributing to the overall economic health of the community (Bopp & Smith, 2021).

Moreover, libraries promote innovation and creativity by serving as hubs for emerging technologies. They provide access to 3D printers, virtual reality equipment, and coding workshops, among other resources. These tools and programs encourage creativity and entrepreneurship among community members, fostering a culture of innovation that can lead to new businesses and economic opportunities (Brown & Venkatesh, 2021). Community engagement and collaboration are other crucial ways in which libraries enhance the digital economy. Libraries facilitate partnerships with local businesses, educational institutions, and government agencies to promote digital initiatives and economic development. They often host community events, hackathons, and networking sessions that encourage collaboration and innovation, helping to build a more connected and resourceful community (Evans & Saponaro, 2021).

Additionally, libraries play an essential role in policy advocacy for digital inclusion. They advocate for policies that promote equitable access to information and technology, working with policymakers to address barriers to digital access. By influencing policy, libraries help to ensure that everyone can benefit from the opportunities offered by the digital economy (ALA, 2023). By enhancing digital inclusion, libraries not only support individual empowerment and educational attainment but also contribute significantly to local economic growth and innovation. They play a vital role in bridging the digital



divide and creating opportunities for all members of society to thrive in the digital age. Through their multifaceted efforts, libraries are instrumental in building a more inclusive and robust digital economy.

### **Enhancing Participation in Civic responsibility**

Enhancing participation in civic responsibility through digital inclusion in libraries involves influencing these institutions to empower individuals and communities to engage actively in civic life. Libraries play a critical role in this enhancement through several key contributions. Firstly, libraries provide access to reliable information about civic rights, responsibilities, and current events. By offering resources on these topics, libraries empower individuals to make informed decisions and participate knowledgeably in civic activities such as voting, advocacy, and community engagement. This access to accurate and comprehensive civic information is essential for fostering an informed citizenry capable of meaningful participation in democratic processes (ALA, 2023).

In addition to providing access to civic information, libraries offer digital literacy programs that teach essential skills for accessing and evaluating online civic resources. These programs help individuals understand fake news, navigate government websites, and participate in online discussions and forums related to civic issues. By enhancing digital literacy and civic education, libraries equip community members with the tools they need to critically engage with digital content and participate effectively in civic life (Bates, 2019). Libraries also promote civic engagement by hosting workshops, seminars, and community events that encourage dialogue on civic issues and foster collaboration among community members. They provide meeting spaces for local organizations and activists to organize and mobilize around important civic causes. These activities help to build a sense of community and collective responsibility, encouraging active participation in civic initiatives (Lloyd, 2023). Supporting government transparency and accountability is another crucial role of libraries. They advocate for policies that promote open access to public information and often partner with government agencies to facilitate public forums, town hall meetings, and access to public records. By promoting transparency and accountability, libraries help to ensure that government actions are visible and subject to public scrutiny, thus fostering a more accountable governance structure (Davis, 2019). Furthermore, libraries encourage diversity and inclusion in civic engagement efforts by providing resources and programming that reflect the cultural, linguistic, and socioeconomic diversity of their communities. This inclusive approach ensures that all voices are heard and represented in civic discussions, promoting a more equitable and representative civic participation (ALA, 2023).

Finally, libraries leverage digital technologies to create platforms for online civic participation, such as virtual town halls, online petitions, and community forums. These platforms expand access to civic engagement opportunities for residents who may face barriers to in-person participation. By utilizing digital platforms, libraries help to democratize access to civic activities, making it easier for more people to engage in civic life regardless of their physical location or personal circumstances (Ifijeh, James, & Adebayo, 2021). By enhancing digital inclusion and promoting civic responsibility, libraries play a vital role in strengthening democracy and fostering a more engaged and informed citizenry. They empower individuals to actively participate in shaping their communities and advocating for social change, thereby contributing to a more vibrant and participatory democratic society.

## **Challenges for Promoting Digital Inclusion in Nigeria**

Promoting digital inclusion in Nigeria faces several challenges, including:

- I. **Budget Constraints:** One of the primary challenges in promoting digital inclusion in Nigeria is budget constraints. The government and relevant stakeholders often face financial limitations that hinder the development and implementation of comprehensive digital inclusion programs. This affects the ability to provide necessary infrastructure, training, and resources required to bridge the digital divide (Agaka, 2024)
- II. **Poor Power Supply:** Nigeria's unreliable power supply severely hampers the ability to sustain digital initiatives. Regular power outages and an unstable electricity grid mean that even when digital tools and services are available, their usability is inconsistent. This issue affects both urban and rural areas, making it difficult for many Nigerians to rely on digital services for essential activities like banking, education, and business (Ministry of Budget and Economic Planning, 2023).
- III. **Poor Network Services:** The quality and reach of network services in Nigeria are often inadequate. While urban areas may have better connectivity, rural and remote regions still suffer from limited or non-existent network coverage. This digital divide exacerbates inequalities, as those in underserved areas cannot access online services effectively. Efforts to expand broadband penetration are ongoing, but progress is slow and requires substantial investment and policy support (Ministry of Budget and Economic Planning, 2023).
- IV. **Digital Literacy:** CILIP (2021) suggests that digital literacy is one of the fundamental skills necessary for digital inclusion. There is a significant gap in digital skills among the Nigerian population, which affects their ability to effectively use digital technologies for education, employment, and civic engagement (Internet World Stats, 2023).
- V. **Language Barriers:** The Nigerian government has initiated various literacy programs over time, such as "Education for All" and the "Mass Literacy Campaign (MIC)." Despite these efforts, about one-third of adults in the country still lack fundamental literacy skills. As a nation with multiple languages, many Nigerians are only proficient in local dialects rather than English. Since most ICT resources brought into Nigeria are set up in English, a significant portion of the population is left out of digital advancements (Agaka, 2024)
- VI. **Cybersecurity:** Internet scams, such as those carried out by "yahooboy," are widespread in Nigeria and have contributed to the perception of the internet as unsafe. Incidents involving the hacking of personal and organizational files and the leaking of sensitive documents have exacerbated the situation. This has increased people's vulnerability to online dangers like identity theft, cybercrime, and exposure to hate sites. As a result, many individuals are now wary of using computers and the internet, preferring to avoid these technologies altogether (Ifijeh, James, & Adebayo, 2016).

- VII. Digital Divide: Disparities in access to digital technologies between urban and rural areas, as well as between different socioeconomic groups, exacerbate inequalities in education, employment, and economic opportunities (Oluyi, 2023).

## **Conclusion**

In conclusion, the article offers a comprehensive exploration of how librarians are pivotal in promoting digital inclusion through the use of educational technology. It underscores the essential role that librarians play in providing equitable access to technology and educational resources, thereby empowering communities and bridging the digital divide. By considering the technology used in libraries and the role of librarians to include all the users digitally in library collections, the high speed internet should be provided and update the equipment into modern ones. The librarians should increase the variety and volumes of digital resources to cater to diverse reading preferences and needs. Implement assistive technologies such as screen readers, magnification tools, and adaptive keyboards to ensure that all patrons, including those with disabilities, can access digital resources. Librarians should also provide multilingual resources in multiple languages to accommodate non-native English speakers. By implementing these technological improvements and enhancing the roles of librarians, libraries can significantly advance their mission of promoting digital inclusion. These efforts will help ensure that all community members have equitable access to the digital tools and resources necessary to thrive in the digital age.

## **Recommendations**

To address the above challenges, the following recommendations were proposed by the author:

- I. To address budget constraints, Nigeria should foster public-private partnerships to enhance digital infrastructure and training. Engaging international agencies for financial and technical support can further bolster digital inclusion efforts.
- II. Nigeria should invest in renewable energy sources such as solar and wind to ensure stable power, particularly in rural areas. Implementing microgrids and encouraging solar panel use can maintain digital services during power outages.
- III. Expanding broadband infrastructure in rural and underserved areas is essential for Nigeria. Incentivizing telecom companies to extend services and providing government subsidies and grants can ensure wider, reliable internet access.
- IV. Developing digital content in Nigeria's local languages can overcome language barriers and include non-English speakers in digital advancements. Translating and creating new materials for different linguistic groups will promote broader digital participation.
- V. Enhancing cybersecurity awareness and infrastructure is critical for Nigeria. Implementing robust measures, regular training, and a regulatory framework, along with awareness campaigns, can build trust and reduce digital risks.
- VI. Bridging the digital divide requires targeted policies to ensure equitable access to technology. Providing affordable internet and devices to low-income households

and tailored training for marginalized communities can promote inclusive digital growth.

## References

- Agaka, S. S. (2024, June 16). Towards achieving 95 percent digital literacy in Nigeria. *Nigerian tribune*. <https://tribuneonlineng.com/towards-achieving-95-percent-digital-literacy-in-nigeria/>
- American Library Association. (2023, April 5). *Core values of librarianship*. <https://www.ala.org/advocacy/intfreedom/corevalues>
- Armitage, L., & Nasser, A. (2018). *Metadata basics for web content: The unification of structured data and content management*. Apress.
- Association of College & Research Libraries. (2020, April 10). *Framework for information literacy for higher education*. <http://www.ala.org/acrl/standards/ilframework>
- Ayob, A. (2020). An Assessment of the Effectiveness of Library Resources and Services in Supporting Researchers' Information Needs. Malaysia
- Bates, A. W. (2019). *Teaching in a digital age: Guidelines for designing teaching and learning*. Tony Bates Associates Ltd.
- Bawden, D. (2020). *Digital libraries and librarianship*. Facet Publishing.
- Bopp, R. E., & Smith, L. C. (2021). *Reference and information services: An introduction*. Libraries Unlimited.
- Brown, S. A., & Venkatesh, V. (2021). Model of adoption of technology in households: A baseline model test and extension incorporating household life cycle. *MIS Quarterly*, 29 (3), 399-426
- CILIP (2024, June 16). *Driving digital inclusion the role of library and information Professionals*. <http://www.cilip.org.uk/sites/>
- Davis, K. (2019). Information inequality: An analysis of the global digital divide. *Georgetown Journal of International Affairs*. 9 (2), 91-105
- Dempsey, L., & Wilson, J. (2019). *Digital literacy unpacked*. Facet Publishing.
- European Commission. (2019). *Digital inclusion and skills in Europe: Final report*. Publications Office of the European Union 2019. <https://europeancommission.org/digitalinclusive/report/2019.html>
- Evans, G. E., & Saponaro, M. Z. (2021). *Introduction to library public services*. ALA Editions.
- Fourie, I. (2019). *Library and information services in the digital age*. Chandos Publishing.
- Januszewski, A., & Molenda, M. (Eds.). (2023). *Educational technology: A definition with commentary*. Routledge.

- Helsper, E. J., & Reisdorf, B. C. (2017). *The emergence of a "digital underclass" in Great Britain and Sweden: Changing reasons for digital exclusion*. New Media & Society.
- Hildreth, S. H. (2018, May 10). *Libraries as community hubs for digital inclusion: A discussion guide*. Institute of Museum and Library Services. <https://www.imls.gov/sites/default/files/publications/documents/digitalinclusiondiscussionguide.pdf>
- Hirsh, S. (2019). *The information professional's career guide in the digital age*. Chandos Publishing.
- Ifijeh, G. James, I. J and Adebayo, O. (2021). Digital inclusion and sustainable development in Nigeria: the role of libraries. *3rd International Conference on African Development Issues (CU-ICADI 2016)*
- Internet World Stats (2022, April 10). The digital divide, ict and broadband internet. <http://www.internetworldstats.com/links10.htm>
- Oluyi, I. (2023). Digital literacy in Nigeria Vs unrealistic project. <https://sciencenigeria.com/digital-literacy-in-nigeria-vs-unrealistic-projections/>
- Lloyd, A. (2022). Information literacy and illiteracies of information: A mid-range theory and model. *Journal of Information Literacy*, 11(1), 91-105. <https://doi.org/10.11645/11.1.2185>
- Ministry of Budget and Economic Planning (2023, June 15). The Pathways to sustainable economic transformation and inclusion in Nigeria lie in innovative policies. <https://nationalplanning.gov.ng/the-pathways-to-sustainable-economic-transformation-and-inclusion-in-nigeria-lie-in-innovative-policies-bagudu/>
- Organisation for Economic Co-operation and Development. (2020). Bridging the digital divide: Measuring digital skills across the European Union. *Hitech library Journal*. 2 (2), 20-34
- Palfrey, J. (2019). *BiblioTech: why libraries matter more than ever in the age of Google*. Basic Books.
- Public Library Association. (2023, May 10). *Public library association advocacy*. <https://www.ala.org/pla/advocacy>
- Rosenfeld, L., & Morville, P. (2019). *Information architecture for the World Wide Web: Designing large-scale web sites*. O'Reilly Media.
- Todaro, J. (2019, May 6). *Mobile libraries are bridging the digital divide*. *American Libraries Magazine*. <https://americanlibrariesmagazine.org/2019/05/01/mobile-libraries-digital-divide/>
- Warschauer, M., & Matuchniak, T. (2023). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*. 17 (1), 13-26

## THE ROLE OF MUSLIM WOMEN IN DA'WAH AND EDUCATION

<sup>1\*</sup>Abdullahi Dalhatu, <sup>2</sup>Ibrahim Lawal Hunkuyi, and <sup>3</sup>Shafaatu Ahmad Aliyu

<sup>1\*</sup>Department of Arts and Social Sciences,  
Faculty of Education,  
Ahmadu Bello University, Zaria, Kaduna State, Nigeria  
Email: [abdullahidalhatu121@gmail.com](mailto:abdullahidalhatu121@gmail.com)

<sup>2&3</sup>Department of Islamic Studies,  
Federal College of Education, Zaria, Nigeria  
Email: [ibrahimlawal386@gmail.com](mailto:ibrahimlawal386@gmail.com) & [shafatuahmadaliyu@gmail.com](mailto:shafatuahmadaliyu@gmail.com)

---

### Abstract

*The paper titled the role of Muslim women in Da'wah (conveying Islamic messages) and education traces the origin and development of education in Islam right from the birth of Islam. It started with the Prophet (S.A.W) receiving the first revelation at the cave of Hira where he used to seclude himself seeking for higher communion from Allah (S.W.T). Da'wah and education are simultaneously carried out with Muhammad (saw) as the teacher and his companions as students including the women who taught and disseminate Islamic education among other women in the community. It traces the origin of education in Islam with the revelation of the first five verses of the Qur'an which commands the Prophet and the companions to equally search for knowledge. Having search for knowledge on one hand to convey it (da'wah) is another important aspect which women have a role to play based on the numerous hadiths of the Prophet (saw) encouraging Muslims to search for it, the methodology adopted for the study was a documentary analysis from the Qur'an and sunnah which direct women to take part in the da'wah activities in accordance with the laid down rules and regulations guiding their activities. Life of Muslim women companions such as Sumayyah and Aisha in the field of Hadith narration was taken as an exemplary measure for Nigerian women. It was concluded that women have a place in the education and tarbiyya of their children and other women according to the teachings of the Sunnah of the Prophet (saw) that everyone is a shepherd in one way or the other and he will be asking about the way he govern them. It was recommended therefore, that women should be allowed to conduct da'wah among their women wing and to utilize every opportunity within their ability.*

**Keywords:** Da'wah, Muslim, Women and Education

### Introduction

Islamic education is uniquely different from other types of education both in theories and practices largely because of the all-encompassing influence of the Glorious Qur'an. The Qur'an serves as a comprehensive blueprint for both the individual and society as the primary source of knowledge. The advent of the Qur'an in the seventh century was quite revolutionary for the predominantly illiterate Arabian society which enjoyed a rich oral tradition, but now the Qur'an was considered the word of God and needed to be the



originally interacted with by means of reading and reciting its words (Ibrahim 2020). Hence, reading and writing for the purpose of accessing the full meaning and blessings of the the Qur'an was an aspiration for most Muslims including Women. Thus education in Islam unequivocally derived its origins from a symbiotic relationship with religious instructions which needed to be conveyed to the whole humanity through Da'wah which Muslim women has role to play so as to achieve happiness and development here and hereafter.

If one should have a casual look at da'wahwork and the position of women in it today one can easily find that, there is a deficiency in the capabilities of da'wah work among and by women, a neglect of omission of women in planning the Islamic da'wah, absence of tarbiyyah and lack of knowledge in daiyat in their field of da'wah and women's da'wah programmes as well as overall da'wah programmes and institutions are rare and not well organised. It is on this background that the paper seeks to assess the role of women in da'wah and education among the Ummah (ommunity)

### ***Historical Origin and Development of Da'wah and Education in Islam***

Prophet Muhammad (SAW) after his marriag with Khadijah, frequently visited a cave of Hira, (a small mountain) not far from Makkah and devoted himself to meditation. he pends one month of every year in deep meditation in the Hera cave (Rahim 2001). He thought about the wretched cond noition of the people, their misbelief, and social evils, and sought for divine light and guidance to lead them to the path of true religion and morality and better social order and system.

The Prophet (S.A.W) was brought up in the environment where reading and writing was not popular. He too is referred to as al- Ummiy (unlettered) in many verses of the Glorious Qur'an though referred to as such, he was destined to initiate a system of education that would be responsible for bringing favours to the world through civilization. The present western civilisation is indebted to a lo for Islamic education. The development of education therefore, is traceable to the coming of Islam itself. It started with the Prophet (S.A.W) receiving the first revelation from his Lord thus:

﴿اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ - خَلَقَ  
الْإِنْسَانَ مِنْ عَلَقٍ - اقْرَأْ وَرَبُّكَ  
الْأَكْرَمُ - الَّذِي عَلَّمَ بِالْقَلَمِ - عَلَّمَ  
الْإِنْسَانَ مَا لَمْ يَعْلَمْ﴾

“ (1.) Read! In the Name of your Lord Who created. (2.) He has created man from a clot. (3.) Read! And your Lord is the Most Generous. (4.) Who has taught by the pen. (5.) He has taught man that which he knew not.” (Q.96: 1- 5)

Iqra'a may mean 'read', or 'recite' or 'rehearse', or 'proclaim aloud', the objective was to understand the devine message of Allah (swt).The Arabic words for teach and knowledge

as used in this five verses of the chapter are from the same root. It is impossible to produce in a translation the complete orchestral harmony of the words for 'read', 'teach', 'pen' (which implies reading, writing, books, study, research), 'knowledge' (including sciences, self-knowledge, spiritual understanding), and 'proclaim' an alternative meaning of the word for 'to read'. This proclaiming or reading according to Dalhatu (2016) implies not only the duty to blazoning forth God's message as going with the Prophetic office, but also the duty of promulgation and wide dissemination of the truth by all who read and understand it including women. The comprehensive meaning of Qara'a refers not only to a particular person and occasion but also gives a universal direction including the women. And this kind of comprehensive meaning as seen, runs throughout the Qur'an - for those who will understand not minding men or women.

Soon after, the revelation continued to flow teaching the Muslims the dictates of their religion which principally centered on the worship of only one Allah. As Muslims began to increase in number, the need for collective educational pursuit was felt, and the house of Arqam bin Arqam was used as the first school of the Prophet (S.A.W) where the Companions received lessons (Rahim 2001). From the very beginning, women have played very vital roles in the propagation and spread of Islamic education and da'wah, this can be seen from the sacrifices of Sumayyah, to the collected Hadiths of Aisha (RA). Unfortunately, during these times, the Islamic revival suffers from weaknesses in its properly qualified personnel, which limits its spreading and restrict the da'wah activities to some elitist group activities with finite and limited efforts of da'wah and tarbiyyah being focused on women.

Later when the Prophet (S.A.W) migrated to Madina, he built his mosque and made it a center for education where various Qur'anic sciences were taught in the masjid (mosque). Different circles in the name of schools were formed, teaching and studying different sciences ranging from Islamic sciences, social interaction, political leadership, military organisation for the defence of Islam and economic education were taught (Rahim 2000). The basis for this system of education and its curriculum is the revelation (the glorious Qur'an) which provide divine information on all these sciences conveyed to all humankind in the name of da'wah i.e. teaching and conveying the message of Islam according to the teachings of the Prophet (SAW).

### **The Concept of Education in Islam**

Islam has, right from its inception, placed a high premium on education and has enjoyed a long and rich intellectual tradition, Knowledge (ilm) occupies a significant position within Islam, Islamic education is uniquely different from other types of educational theories and practices largely because of the all-encompassing influence of the Qur'an. The Qur'an serves as a comprehensive blueprint for both the individual and society and is the primary source of knowledge. The advent of the Qur'an in the seventh century was quite revolutionary for the predominantly illiterate Arabian society. The Arab society had enjoyed a rich oral tradition, but the Qur'an was considered the word of Allah (SWT) and needed to be originally interacted with by means of reading and reciting its words. Hence, reading and writing for the purpose of accessing the full blessings of the Qur'an was an aspiration for most Muslims. Thus, education in Islam derived its origin from a symbolic relationship with religious instructions (Abdullahi, 1984)

Education in the context of Islam is regarded as a process that involves the complete person, including the rationale, spiritual, and social dimensions (Naquib al-Attas

Muhammad 1979), the comprehensive and integrated approach to education in Islam is directed towards the balance growth of the total personality of the individual through training of mans' spirit, intellect, rational self, feelings and bodily senses such that faith is infused into the whole of his personality.

In Islamic education theory, knowledge is gained in order to actualize and perfect all dimensions of the human being, from an Islamic perspective the highest and most useful model of perfection is the Prophet Muhammad (SAW) as the Qur'an reads:

﴿لَقَدْ كَانَ لَكُمْ فِي رَسُولِ اللَّهِ  
أُسْوَةٌ حَسَنَةٌ لِّمَن كَانَ يَرْجُو اللَّهَ  
وَالْيَوْمَ الْآخِرَ وَذَكَرَ اللَّهَ كَثِيرًا﴾

*“ Indeed, in the Messenger of Allah  
you have a good example to follow for  
him who hopes in Allah and the Last  
Day, and remembers Allah much.  
“(Q.33:21)*

This Ayah is an important principle, to follow the teachings of the Prophet (SAW) in his teachings and actions or deeds as in da'wah activities, to this end Hossein (1984) wrote that while education does prepare humankind for happiness in this life, its ultimate goal is the abode of permanence and all education points to the permanent world of eternity.

Education in Islam is twofold: acquiring intellectual knowledge (through the application of reason and logic) and developing spiritual knowledge (derived from divine revelation and spiritual experience), According to the worldview of Islam, provision in education must be made equally for both sexes. Anas ibn Malik reported: The Messenger of Allah, peace and blessings be upon him, said:

*“Seeking for knowledge is an  
obligation upon every Muslim” (Ibn  
Majah 224)*

Acquiring knowledge in Islam according to this Hadith is not only the responsibility of men but also women are inclusive and it is not intended as an end but, as a means to and stimulate a more elevated moral and spiritual consciousness, leading to faith and righteous action, Women who understood their role, would educate themselves and achieve their right to education and Tarbiyah. Look at the Hadeeth of the prophet (S.A.W) narrated by Abu Saeed that a woman said to the prophet (SAW).

*“The men are keeping you busy and  
we do not get enough attention from  
you. Would you specify a day for us,  
women? He promised them a day to  
meet them and educate them”  
(Bukhari 1:101).*

The fruits of this understanding and concern by the women companions of the prophet (S.A.W), shows that women can receive education and educate others through any one or all of the da'wah means, methods and techniques. Not only this, many verses in the Qur'an obligate Muslim women to do da'wah, and enjoin good and forbid evil. Example, Allah says:

*“Let there arise out of you group of people inviting to all that is good (Islam). Enjoining good and forbidding evil. And it is they who are successful” (3:104).*

An understanding of this verse according to Ali (1968) is that, calling to Allah becomes obligatory upon everyone male or female according to each person's individual ability. If one lives in a town or city where there are others carrying out this task and are conveying the affair of the religion sufficiently, then calling to Allah takes the ruling of being recommended in relation to everyone in the area, the ideal Muslim community is happy, untroubled by conflicts or doubts, sure of itself, strong, united, and prosperous: because it invites to all that is good, enjoins the right; and forbids the wrong.

Women have been expressly addressed with the duty of the da'wah because Allah (S.W.T), says:

*“O wives of the prophet! You are not like any other women. If you keep your duty (to Allah) then be not soft in speech, lest he in whose heart is a disease should be moved with desire, but say that which is ma'roof “(good) (Q.33:32)*

Ibn Abbas understood Allah's injunction to the prophet's wives, to “say good”, to mean that they have to enjoin what is good and forbid what is evil. This can be taken as a general address to all Muslim women. Allah also says:

*“The believers, men and women are Auliya (helpers, protectors) of one another, they enjoin the good and forbid the evil, they perform Salah and give away Zakah and obey Allah’ (Q.9:71)*

It is clear in this verse that women are addressed with this task of education and da'wah, just as men, whenever they are capable of discharging it. Da'wah is used as an instrument of educating people in matters that could promote their religious faith as well as promote their life in the world. In view of this, the first assignment given to all Prophets was to educate people about this essence. The following Qur'anic verse substantiates the statement:

*Say, this is my way; I invite to Allah with insight, I and those who follow me. and exalted is Allah; and I am*

*not of those who associate others with Him". (Q12:108)*

Everyones effort fills a need of some kind. A Muslim scholar will address his counterpart with refined style and scholarly content, while a layman will reason with his equals in practical terms, each having a role complementary to the other. Therefore, every individual of the Muslim ummah male or female is obligated to be actively engaged in whatever way he can to guide people to the right path and to support, morally and materially.

In a Hadith, Khuraym bin Fatik (RA) narrated that Allah's Messenger (SAW) said:

*"Whoever spends a sum in the cause of Allah, it is recorded for him seven-hundred-fold." If anyone makes a contribution towards Allah's path, seven hundred times as much will be recorded to his credit." (Tirmidhi, 1625)*

In view of the importance attached to Da'wah activities, the Prophet (S.A.W.), received the revelation of the ultimate book, containing all guidance that touches every aspect of man's need, Allah the Almighty says:

*"...We have sent down to you the Book, as clarification for all things, and as guidance, and mercy and good tidings for the Muslims. (Q16:89)*

The Prophet (SAW) therefore, used the Qur'an as a guide to educate people in matters of their religion and worldly affairs. The comprehensive nature of the Qur'an in dealing with all matters of importance is an indication that Da'wah has its fundamental mission of promotion of knowledge and every worthwhile value. In view of this the Prophet (SAW) commanded for the conveyance of all knowledge as from him. He says:

**وَلَوْ آيَةٌ عَنِّي بَلَّغُوا**

*"Convey from me even if it is a Sentence" (Bukhari vol. 4. 3461)*

This means that any Muslim could perform da'wah either male or female and thus, educate the Ummah to the extent of his own knowledge and ability. The Prophet (SAW) also emphasized the obligation of enjoin what is right and forbidden what is wrong to include all sexes by saying:

*"All of you are shepherds, and each of you is responsible for his flock. The Imam is a shepherd, and he is responsible for his flock. The man is a shepherd among his family, and he is responsible for his flock; and the woman is a shepherd in her husband's*

*home, and she is responsible for her flock.” (Bukhari and Muslim)*

The prime mission of Da'wah is to guide people to what is better. In this regards a Da'i (a person who undertake the work of education and Da'wah) is commanded to carefully study circumstances in relation to individual/group and offer Islamic guidance accordingly. The Da'wah activities were not geared to imposition on people but rather to develop the sense in people to receive guidance of the religion. The Qur'an states:

*There shall be no compulsion in [acceptance of] religion. The right course has become clear from the wrong So. Whoever disbelieves in taghut and believes in Allah has grasped the most trustworthy handhold with no break in it. And Allah is most Hearing and all Knowing. (Q2:256)*

The above verse shows that One needs to understand that the Qur'anic command and prohibitions are directed to both sexes including such verses enjoying da'wah. Example:

*And let there be arising from you a nation inviting to all that is good, enjoining what is right and forbidden what is wrong, and those will be the successful (Q.3:110).*

The above verse has been taken to mean general, meaning that all members of the Ummah has this function in respect of whether male or female (Kassas2005) Darraz in kassas (2005) had a contrary view that da'wah is compulsory only on those capable few with the assistance and cooperation of all, if it is not done by any one, they will be blameworthy. Some verses mention women specifically along with men in order to put emphasis on the fact that they are included.

Da'wah work for a woman may be somewhat specialized, since recipient are often family members, neighbors or women's circles. The home is her first base, and the Islamic upbringing of her children is the primary duty about which she will be questioned on the day of judgement according to the sayings of the Prophet (SAW) in the hadith above. Mothers have great influence over their children since the child is by nature most attached to her, especially in the formative stage or years. Moreover, many wives have ability to influence their husbands in positive ways. Besides the home there are other fertile fields for education and da'wah by women in social groups, schools, hospitals, workplaces even in the female sections of the prison.

A woman scholar will address her counterpart with refine style and scholarly content, while a lay woman will reason with her equals in practical terms, each having a role complementary to the other. Therefore, every individual of the Muslim Ummah including the women is obligated to be actively involved and engaged in whatever way he can to



educate, guide and convey (da'wah) people to the right path and support, morally and materially.

Kassas (2005) quoting ash-Shatibi said: “inviting people to Islam is wajib (imperative) because its implementation is obligatory upon all”. Thus, one can rightly conclude concerning the ruling may be drawn that general propagation of Islam should be done by all Muslims both male and female according to the circumstances and abilities. In addition, women are best suited for da'wah and education of other women. Hence there should be participation by both men and women and cooperation between the. The Qur'an reads in this regards:

أُولِيَاءَ بَعْضٍ يَأْمُرُونَ بِالْمَعْرُوفِ  
وَيَنْهَوْنَ عَنِ الْمُنْكَرِ وَيُقِيمُونَ  
الصَّلَاةَ وَيُؤْتُونَ الزَّكَاةَ  
وَيُطِيعُونَ اللَّهَ وَرَسُولَهُ أُولَئِكَ  
سَيَرْحَمُهُمُ اللَّهُ إِنَّ اللَّهَ عَزِيزٌ  
حَكِيمٌ ﴿٩٧﴾

“The believers, men and women, are supporters of one another; they enjoin good, and forbid evil; they perform the Salah, and give the Zakah, and obey Allah and His Messenger. Allah will have His mercy on them. Surely, Allah is All-Mighty, All-Wise.” (Q.9:71)

It is upon said that da'wah is only the responsibility of specialist in the field of Shariah and not others, or that it is required of men and not women. This assertion shows ignorance of Islamic principles. Once Caliph Ma'mun tried to prohibit a caller from his activity, declaring that Allah (SWT) said:

﴿الَّذِينَ إِذَا مَكَّنَّاهُمْ فِي الْأَرْضِ أَقَامُوا  
الصَّلَاةَ وَآتَوُا الزَّكَاةَ وَأَمَرُوا  
بِالْمَعْرُوفِ وَنَهَوْا عَنِ الْمُنْكَرِ﴾

“Those who, if We give them power in the land, (they) establish the Salah, enforce the Zakah, and they enjoin the good and forbid the evil.” (Q.22:41)

Ibn Hatim in ibn kathir (1989) was of the view that this Ayah was revealed concerning us, for we had been expelled from our homes unjustly only because we said: ‘Our Lord is Allah.’ Then we were given power in the land, so we established regular prayer, paid the

Zakah, enjoined what is good and forbade what is evil, and with Allah rests the end of (all) matters.

(Those who, if We give them power in the land....) Then he said, "This is not obligatory only for those who are in authority, it also applies to those who are governed by them. Shall I not tell you what you can expect from your governor, and what duties those who are ruled owe to him Your rights over your governor are that he should check on you with regard to your duties towards Allah and restore the rights that you have over one another, and that he should guide you to the straight path as much as possible. Your duties towards him are that you should obey him without cheating and without resentment, and you should obey him both in secret and openly.

Women have the role to reform or rectify conduct and reinstitute many erroneous practices that have come to be social phenomenon in the society, Women have the role of recognizing the ills of evils and blocking the way to them the process of da'wah is that of change, it gives new knowledge or re-affirms the old knowledge already acquired leading to a change in spiritual and social awareness of an individual. Attitude to God and society changes as bits and pieces of new knowledge and convention are acquired and the individual begins to understand his position in the entire creation and his responsibility to the Creator and Society at large Prominent Women In the Field of Da'wah.

The Qur'an clearly states that women have equal rights, the muslim women played vital roles in the propagation and education of the ummah or the divine message of islam. Ibrahim (2020) stressed that Muslim women played a great role in sacrifices and services for the religion of Allah. He gave the following instances when Sumayyah gave up her life when Abu-Jahl killed her for becoming a Muslim; Khadijah the first wife of the prophet, who was very rich, spent of her money to support the da'wah; Umm Salamah left her husband and saw her children persecuted when she migrated; Umm Imarah fought in defense of the prophet (S.A.W), in the Uhud battle. Tending the wounded in battles was the role Muslim women played through history. Women have a definite responsibility and role in education and da'wah, no less important than that of men. Except for specific instances which are clear in context, the Qur'an's command and prohibitions are directed to both sexes, including those verses enjoining dawah. Moreover, the Quran makes these two statements:

*"The hypocrites, men and women, are one from another; they enjoin evil, and forbid the good, and they close their hands. They have forgotten Allah, so He has forgotten them. Verily, the hypocrites are the rebellious. Allah has promised the hypocrites men and women and the disbelievers, the fire of Hell; therein shall they abide. It will suffice them. Allah has cursed them and for them is the lasting torment. "(Q. 67 - 68)*

*"The believers, men and women, are supporters of one another; they enjoin good, and forbid evil; they perform the Salah, and give the Zakah, and obey Allah and His Messenger. Allah will have His mercy on them.*

*Surely, Allah is All-Mighty, All-Wise.”  
(Q.9:71)*

It is clear in this verse that women are addressed with this task, just as men, whenever they are capable of discharging it. Furthermore, the following points, when properly put into perspective also lead to the understanding that women are as responsible for carrying out Da'wah as men are:

Because Islam prohibits the free mixing of men and women and the maintenance of Hijab, it becomes vital, as well as practical, to have qualified women to do Da'wah work among women in the community.

Some of the shariah rulings were reported from the prophet (saw) only through women companion. Sometimes it is difficult for the male Du'at to carry out all that the Da'wah among women requires because women have some private conditions that they may not feel comfortable revealing to men, and would rather convey them only to other women.

*“Allah has promised the believers men and women, Gardens under which rivers flow to dwell therein forever, and beautiful mansions in gardens of `Adn (Eden; Paradise). But the greatest bliss is the good pleasure of Allah. That is the supreme success” (Q. :72.)*

## **Conclusion**

From the foregone discussion, it can be concluded that da'wah amongst women deserves, and should get far more attention than it does. So far, except in a few instances, women have been distanced from the field of da'wah and education work, almost every woman can find subtle ways to perform da'wah in her own home and reap the reward of it in this life even before the next. Thus, one can rightly conclude concerning the ruling may be drawn that general propagation of Islam should be done by all Muslims both male and female according to the circumstances and abilities I.e. the obligation to educate and carry out da'wah is not restricted to males and women are often effective and implement all in reforming entire family. In addition, women are best suited for da'wah and education of other women. Hence there should be participation by both men and women and cooperation between them.

## **Recommendations**

It is recommended therefore, that:

- I. Those women who are unmarried or who no longer have children at home and have some free time can study the possibilities, evaluate their capabilities, and then branch out into one or more of these fields in accordance with their particular circumstances and personal preference.
- II. Islamic schools should provide educational activities and curriculum which can be used for guidance of girls students as well as women teachers and staff

- III. The masjid: Women should be allowed to go to the masjid to benefit from the lessons held there.
- IV. The mosque should be a suitable place for some of the women activities such as Qur'an study groups and other training.
- V. Women should be involve in the planning and organisation of Da'wah activities that concerns women wing.

## **References**

- Abdullahi. Y. A., (nd). *The holy Qur'an Text, Translation and Commentary Vol. 1* Dar al - Arabia
- Abdullahi A.S., (1982) *educational Theory: A Qur'anic outlook makkah, Saudi Arabia: Ummul al- Qura University Press*
- Dalhatu A., (2016) *Assessment of Da'wah Activities Among Maguzawa People of Zazzau Emirate, Kaduna State, Nigeria*. Unpublished Masters Theses Ahmadu Bello University, Zaria, Nigeria.
- Al-Alawni T.J. ,(1991) *Taqlid and the stagnation of the Muslim mind American journal of islamic social sciences 8:513-524*.
- Rahim a., (2000) *Islamic History* Islamic Publications Bureau, 136A, Isolo Road, Mushin Lagos, Nigeria, West Africa.
- Kassas. S. (2005) *Fiqh ad-Da'wah* Jeddah, Saudi Arabia.
- Ibn Kathir, A.I. (1989) *Tafsirul Qur'an al-Azim*, I. Beint: Dar al-Ma'arifa.
- Ibrahim L. H (2020) *Principles and Procedures of conveying the Message of Islam (Da'wah) According to Qur'an and Sunnah* Ahmadu Bello University Press Limited, Zaria, Kaduna State Nigeria.
- Ibrahim L. H (2021) *Assessment of the Impact of Da'wah Activities on Curving Social Problems in Northern Nigeria*. Ph.D Desertation Ahmadu Bello University, Zaria
- Muhammad, N.A (1979) *Aims and objectives of Islamic Education* jeddah, Saudi Arabia: Hodder and Stoughton

## ASSESSMENT OF SELF MANAGEMENT COUNSELLING TECHNIQUE AND SOCIAL PHOBIA AMONG NIGERIAN UNDERGRADUATE STUDENTS

\*<sup>1</sup>Tanimu Umar – Mcasson, <sup>2</sup>Musa Yusuf Kabara, & <sup>3</sup>Nasiru Ibrahim

<sup>1</sup>Department Of Arts And Social Science Education,  
Faculty Of Education,  
Yusuf Maitama Sule University Kano  
Email: [tamimumar00@gmail.com](mailto:tamimumar00@gmail.com)

<sup>2</sup>Department of Economics,  
School of Secondary Education, Arts and Social Science,  
Aminu Kano College of Islamic and Lugal Studies  
Email: [kano.muyuk80@gmail.com](mailto:kano.muyuk80@gmail.com)

<sup>3</sup>Department of Education,  
Zamfara College Of Arts And Science Gusau Zamfara State  
Email: [nasiruibrahim2018@gmail.com](mailto:nasiruibrahim2018@gmail.com)

---

### Abstract

*This research investigated the assessment of Self-Management counselling technique and social Phobia among Nigerian undergraduate students. Concept and dimension of social phobia (cognitive, behavioural and psychological dimension) were discussed, symptoms such as Feelings of shyness or discomfort in certain situations aren't necessarily signs of social phobia disorder, particularly among undergraduate and genetic, environmental, and parental, courses of social phobia were also addressed. Self management counselling technique, procedure and process on how to improve the process were discussed. The researcher suggested that counsellors and teachers should be encouraged to use self management counselling Technique in addressing social phobia behaviour among Nigerian undergraduate students and students should be given equal opportunity and exposure to the techniques in re-addressing social phobia in schools, this will help improve the active participation in class participation and enhance teaching and learning process..*

**Keywords:** Self-Management, Social Phobia, Undergraduate students

### Introduction

Social phobia is a fast growing phenomenon, which is thought to disproportionately affect university undergraduate students. The global prevalence of Social phobia was found to be significantly higher with more than 10 million university undergraduates students in America. The symptoms of Social phobia did not differ between sexes but varied as a function of age, country, work status, level of education, and whether an individual lived in an urban or rural location and is also known for its association with depression and substance use disorder. While in case of Nigeria, university students are associated with social phobia especially at the beginning of their program. This social phobia lead to low performance and poor academic achievement among students, because social phobia is a

normal situation which one should not be afraid to participate in. Many university undergraduate students usually feel uneasy, fearful and anxious some even go to the extent of illness as result of this social phobia. This situation has broad negative consequence which emanates stress in students' concentration and psychological worries. It should be noted that the poor academic performance should not be attributed to student's intellectual problems only, but the social phobia situation created in students serve as factor of poor academic achievement. Social phobia is something that almost everyone experiences to some extent in any stressful situation. For university students one of the most frequent stressful or anxiety provoking experiences is social phobia. The anxious feeling can occur while the students is about to enter the university and during the university. Social phobia is an uneasiness or apprehension experienced before, during, and after the university. Almost every student experiences some phobia.

Social phobia is “the set of phenomenological, psychological, and behavioural responses that accompany concern about possible negative consequences (Chapell, Blanding, Takahashi, Silverstein, Newman, Gubi, & McCann, 2015) Crozier as cited in Sola, (2014) reported that there are three separate response systems that can be used to analyze emotional behavior: the cognitive verbal, the behavioral-expressive, and the bodily-expressive system. Thus, it might be fruitful to distinguish between cognitive, behavioural, and physiological aspects of social phobia.

### ***The Concept of Social Phobia***

The term Social phobia was first coined by Wolpe (1958), who described Social phobia is a term used to describe the excessive fear, nervousness and apprehension that, undergraduate students and other people experience in their social interactions. This can cause considerable discomfort and embarrassment and often affect the person's ability to act naturally or perform a task in front of people. Olamiji and Badru (2014), explained that Social phobia is a persistent fear of one or more situations in which others expose the person to possible scrutiny and fears that he or she may do something or act in a way that will be humiliating or embarrassing. Social phobia involves overwhelming phobia and excessive self-consciousness in everyday social situations. It is both a persistent and irrational fear of situations in which the person feels they may be closely watched and judged by others, as in public speaking, eating, or using public facilities. Feared activities may include most type of social interaction, especially small groups, parties, talking to strangers, restaurants.

### ***Dimension of social phobia***

#### ***Cognitive dimension of social phobia***

Situations that can provoke anxiety include talking in groups, meeting people, going to school or work, going shopping, eating or drinking in public, or public performances such as public speaking. People with social phobia believe that social situations pose a danger. They fear negative evaluation, believing in particular that “(1) they are in danger of behaving in an inept and unacceptable fashion, and, (2) that such behavior will have disastrous consequences in terms of loss of status, loss of worth, and rejection” (Clark & Wells, 2019).

#### ***Behavioural dimension of social phobia***

Behaviours are actions which are intended to reduce the risk of negative evaluation. They are problematic because they “prevent unambiguous disconfirmation of their unrealistic



beliefs about feared behaviors or the consequences of these behaviors” (Adam & Ammar,2017). Non-occurrence of the feared catastrophe is attributed to the safety behavior, rather than the socially anxious person concluding that the situation is less dangerous than they had previously believed.

### ***Physiological dimension of social phobia***

Social phobia exhibit the same somatic symptoms during anxiogenic exposure as observed in other anxiety disorders (Vieira & Matos, 2015). Palpitations, sweating, hand tremor, hot flushes. These arousal symptoms stem from exaggerated activity in the sympathetic division of the autonomic nervous system, and are characteristic features of the “fight-or-flight” response (Garcia- Lopez 2016). However, facial blushing and somatic symptoms of embarrassment, which are common in social phobia, might not be simply mediated by increased sympathetic activity.

### ***Types of Social Phobia***

Wolpe (1958), as cited in Akinade (2015), stated the following as the major type of social phobia, among the undergraduate students which include the following

- I. 1 Generalized Social Phobia: Generalized Social Phobia, It is normal to feel anxious from time to time, especially if one’s life is stressful. However, excessive ongoing social phobia and worry that interfere with daily activities may be a sign of generalized social phobia. It is possible for university students to develop generalized social phobia. Mitchel (2019), pointed out, that the tendency of having difficulty in the learning and teaching process can aggravate nervousness, having difficulty organizing thoughts, restlessness, among others

Those who suffer generalized social phobia have three areas of phobic behaviour:

- a. Social interaction such as meeting friends or going to parties
  - b. Performance such as giving a presentation in front of classmate or others
  - c. Observation such as being seen by others, even just walking down a street in public
- II. Specific Social Phobia: Mental health professionals often distinguish between generalized social phobia and specific social phobia. Specific social phobia is the intense fear, anxiety, and avoidance of a specific object or situation (e.g., flying, heights, injections, animals). People with generalized social phobia have great distress in a wide range of social situations (Musa 2014). Those with specific social phobia may experience phobia only in a few situations. The term "specific social phobia" may also refer to specific forms of non-clinical social phobia. The most common specific social phobias are glossophobia (the fear of public speaking) and stage fright (the fear of performance). Others include fears of intimacy or sexual encounters, using public restrooms, attending social gatherings, and dealing with authority figures (Umar et al., 2021).
  - III. Agoraphobia; According to Anastasi (2015). Agoraphobia is a type of social phobia disorder in which you fear and avoid places or situations that might cause you to panic and make you feel computable, helpless. Agoraphobia is fear of an actual or anticipated situation, such as using public transportation, being in open or enclosed spaces, standing in line, or being in a crowd. This type of social

phobia is caused by fear that there's no easy way to escape or get help if the social phobia intensifies. Anastasi (2015) further explain that, most people who have agoraphobia develop it after having one or more panic attacks, causing them to worry about having another attack and avoid the places where it may happen again. People with agoraphobia often have a hard time feeling safe in any public place, especially where crowds gather.

### ***Symptoms and Diagnosis of Social Phobia***

It's normal to feel nervous in some social situations. Giving a presentation may cause social phobia. But social phobia disorder, everyday interactions cause significant phobia, self-consciousness and embarrassment because you fear being scrutinized or judged negatively by others (Kande, 2015).

According to Umar et al., (2021). Feelings of shyness or discomfort in certain situations aren't necessarily signs of social phobia disorder, particularly in undergraduate. Comfort levels in social situations vary, depending on personality traits and life experiences. Some people are naturally reserved and others are more outgoing. In contrast to everyday nervousness, social phobia disorder includes fear, anxiety and avoidance that interfere with relationships, daily routines, work, school or other activities. Social phobia disorder typically begins in the early to mid-teens, though it can sometimes start in younger children or in adults.

According to Kande (2015), the signs and symptoms of social phobia disorder can include constant:

- I. Fear of situations in which you may be judged negatively
- II. Worry about embarrassing or humiliating yourself
- III. Intense fear of interacting or talking with strangers
- IV. Fear that others will notice that you look anxious
- V. Fear of physical symptoms that may cause you embarrassment, such as blushing, sweating, trembling or having a shaky voice

### ***Characteristic of People with Social Phobia***

Clark and Wells, (as cited Portia & Osuji, 2016), suggested that people with social phobia usually go through the following characteristic in three-stage process:

- Stage 1: People with social phobia hold a set of beliefs about themselves that ultimately set the scene for difficulties during social encounters. Sometimes these same people can remember one or more key moments during their early years that have since developed into a negative association. For example, a comment about some physical aspect like body odor or sweaty palms, or the fact they dressed inappropriately or sounded nervous.
- Stage 2: Involves the social interaction itself. At the first sign of social threat the person feels their body responding by trembling, increased pulse rate, mental blanks and feeling flustered.

Stage 3: Involves a process of self-evaluation and discrimination following a social exchange. They characteristically evaluate their performance as negative or ambiguous at best. Ambiguities frequently become recast as negative and the whole process feeds back into the beliefs they hold about themselves and as previously outlined in stage.

### ***Causes of Social Phobia Disorder***

Researches into the causes of social phobia are wide-ranging, encompassing multiple perspectives from neuroscience to sociology. Scientists have yet to pinpoint the exact causes.

- I. Genetic Causes ; Studies suggest that genetic can play a part in combination with environmental factors. According to Montesi Conner (2014), asserts that social phobia is not caused by other mental disorders or by substance abuse. Generally, social phobia begins at a specific point in an individual's life. This will develop over time as the person struggles to recover. Eventually, mild social awkwardness can develop into symptoms of social phobia.
- II. Environmental Causes; Social Phobia is genetically transmitted disorder but some time is course by some environmental factors. The environment in which a students is raised can contribute to the kind of behaviour such a students will put up. For instance, the influences of parents, extended family, care giver, poor school performance, difficult temperament, inflated self-esteem, impulsivity, low verbal intelligence. Peer and neighborhood risk factors may play a significant in the development of Social Phobia disorder and others and therefore, Healthy environment will produce healthy students while unhealthy environments will encourage or promote SPD and other behavioural disorder. (Aderka & Hofman, 2015).
- III. Temperamental Causes; Mussen, Conger, Kagan, and Huston, (as cited in Ahmed, 2019) defined temperament as an inborn biases towards certain moods and emotional reaction styles and they depicted two temperamental styles of students called inhibited and uninhibited. Inhibited children are characterized by withdrawal and increased autonomic arousal in situations of uncertainty, in contrast to uninhibited students who tend to react with spontaneity and approach in these situations.
- IV. Parental Causes; Hudson and Rapee (2019) in their study found out that there is a reciprocal relationship between parent and child behaviour. They then claim that anxious students are more likely to have anxious parents whose behaviour may maintain phobia and avoidance. Also Hadi and Maryam (2015), observed that a parent with social phobia disorder is more likely to have anxious offspring, and therefore believed that the risk for social phobia disorders in offspring of anxious parents was 3.5 times that of non-anxious students.

### ***Challenges of Social Phobia Disorder***

Social phobia disorder will not only hinder our social interactions and relationships, but also have some challenge on our physiological, Cognitive and behavioral as well. If social phobia disorder is appropriately and professionally addressed and treated, the prognosis for this mental health condition can be drastically improved. The following are some of the major challenges of social phobia stated by Bengner, 2015.

### ***Physiological challenge of social phobia***

Physiological Effects of social anxiety disorder can be common, even while social phobia involves social behaviours. These are some physiological effects that may be experience, Umar et al., (2022):

- I. Racing heart or tightness in chest due to nervousness
- II. Difficulties in occupational functioning
- III. Emotional detachment
- IV. Extreme feelings of fear inferiority
- V. Profuse sweating/shaking
- VI. Difficulty initiating or sustaining relationships

### ***Method of Controlling Social Phobia***

The treatment of SPD is typically involves the following three folded process of using cognitive behavioural principles and techniques as described in MacManus (2013):

- I. Challenging and Changing Dysfunctional Thinking. Students with social phobia disorder tend to have a lot of limiting beliefs, plus an unrealistic view of social standards and of themselves. These need to be corrected by consciously changing the way they think.
- II. Gradual Exposure: Students with social phobia disorder need to be gradually face those exact situations they are afraid of and they typically avoid. Systematic exposure, combined with combined with combating unrealistic thinking that will set their mind and emotions on the right path.
- III. Improving social Skills: Since students with SPD avoid social situations as much as they can, their social skills have often atrophied or they have never truly developed at all. Thus, training key social skills and learning how to start conversation, how to keep it going or how to connect with people is crucial.

### ***Self-Management Technique***

Self-management technique allows students to maximize their productivity, improve their academic performance and efficiently achieve professional goals. Improving their Self-Management technique can help students to increase their employability and better manage their social phobia situation. In this , we identify self-management technique related to social phobia.

- I. Self-Monitoring Technique ; Self-Monitoring could be referred to as a process of controlling student's behaviour in accordance with observed appropriate behaviours. However, for Dombeck and Wells-Moran (2014), stated that Self-Monitoring involves the student's ability to learn how to pay careful and systematic attention to his problems, behaviours and habits and to the stimuli that trigger them. Furthermore Dombeck and Wells-Moran , ( 2017 ) . pointed out that Self-Monitoring at its best, when it is approached in a primarily quantified way. In other words the student's is made to decide what behaviors or habits to be monitor, the occurrence of each and every behavior are counted and recorded.

- II. Thought Stopping Skill; In using Self Control technique thought Stopping comes to play bearing in mind that to effect a change students stops the negative act to initiate a new and positive one. In trying to correct a fault in electricity the electrician switches off the current and on correction of the faults switches on the electricity. Becks (2018), earlier pointed out in his study that when students changes what he thinks, he can change his mood. In other words, student's behavior mirror's students feeling, hence, in thought stopping, the students consciously issue the command "stop", when repeated negative, distorted or unnecessary thoughts are being experienced.
- III. Self Talk Technique; Self statements have implications for the emotional reaction that could result from them. The bid to alleviate any behaviour related problem might develop proficiency in adjusting to real life challenges. To this Wine (2019), opined that research showed that the self-talk of students with social phobia usually tend to be negative and self-defeating with negative statements. "inner voices" as patterns of internal conversation in narrative form as it influences self. Laderman (2016), earlier pointed out that these inner voices influences interpersonal relationships. In conclusion,demonstrated that self-talk provides a way to actively manipulate the environment, evaluate self, find meaning and direct ones behaviour accordingly and that adequate management of self-talk may be important in allowing therapists to maintain an appropriate focus on clients.

#### ***How to improve self-Management skills***

Enhance your self-management skills by actively focusing on ways you can direct, evaluate and improve upon your daily tasks. Here are a few ways you can improve your self-management skills Umar et al., (2021):

- I. Assess your strengths. Determine what professional tasks you're best at, and focus on ways to maximize your abilities in these areas. Understanding your strengths helps you manage your social phobia in a way that makes the most of skills like coding, technical writing, graphic design or customer service.
- II. Practice patience. Maintain a sense of calm so students can think clearly and objectively. Be considerate of others, and try to empathize with their needs and experiences to more effectively help them.
- III. Take care of students health and wellness. Maintain a proper diet, exercise regularly, care for your personal hygiene and actively focus on lowering your stress levels. Take breaks to stretch and clear students mind, keep healthy snacks at work and look for opportunities for physical activity, such as a brisk walk on your lunch hour.
- IV. Evaluate students progress. Objectively assess the progress students made toward their goals by setting checkpoints along the way and tracking your accomplishments to see if you've met them. Ask a mentor for assistance to get a well-setting appraisal. Use this feedback to improve your Self-Management going forward

### ***Process of Self – Management Counselling Technique***

Self-management is the ability to manage stress and impulsive while motivating oneself to meet a specific goal. Self management strategies for students start before problem behavior occur, however, they can replace disruptive behavior by substituting them with more desirable conduct John (2019).The process or stages are as follows;

1. **Goal Setting** ; Students and teachers should cooperate In setting small reachable goal that the student can work towards, goals can be anything from "working quietly for 15minutes" to turning in "homework consistently" by allowing the students to participate in setting their goals, you empower them to take an active role in self management strategies as well as self management intervention
2. **Behaviour Monitoring**; Self-monitoring, or behavior monitoring occur when students observe and record their behaviours, redirecting themselves when necessary. They practice thier self awareness skill and build a record of their difficulties and success. Through self monitoring, student become more aware of where they struggle and where they succed. As their self awareness increases they gain confidence in their ability to redirect themselves and participate in self reinforcement activities.
3. **Self-Reinforcement**; Self reinforcement is the act of rewarding oneself after completing the desired behavior or meeting a goal. Rewarding positive behaviour increases in likelihood your students will repeat behaviour. According to psychology today,85% of people who don't learn self-reinforcement have trouble to other areas, like self esteem. Reward can be completing an assignment, extra computer time or assigning classroom jobs, tailor the reward to the students and the behaviour you want to reinforce with the self management plan ,Umar, T. Yunusa S, & Ado M, (2021)..
4. **Self Evaluation**; While students may look forward to the rewards, reflection of the process teaches them the most what help inspire them? What was the most challenging part of the process? Was the reward worth it? What can they do better the next time? These questions and answers help teachers and students gain confidence in themselves and their skills.they can also identify areas where the teachers and students believe they can improve. This self-evaluation process also teaches students the power of resilience and perseverance they learn that failure can happen but if they keep trying, they can succeed.

### ***Self-Management can be implemented through the following stages***

According to Umar, (2022) the following are some of the ways of implementing self-management;

- I. First, bring the target behavior under control using externally-managed (i.e., teacher-administered) intervention techniques, when necessary.
- II. Select a system of data recording that is appropriate to the target behaviour and to the abilities of the student. Acquire or construct the necessary materials (e.g., recording sheets, clipboards, timers, wrist counters).
- III. Let the student determine, with your guidance, the performance criterion that must be achieved to earn reinforcement. This criterion should be specific and also



achievable. In the early stages, it should be possible to attain it immediately rather than distantly. Let the students determine, with your guidance, the amount and type of reinforce to be administered.

- IV. Instruct the students how to use the data recording system. Consider modeling its use, simulations, and role playing. Conduct and supervise some practice data-recording sessions in the environment in which the student's actual recordings will occur. Reinforce the student when the student's recordings match yours. Re-train the student if the student's recordings are too inaccurate.

### Suggestion

- I. Based on the above explanation it can be suggested that, counsellors and teachers should be encouraged to use self management counselling Technique on re-addressing social phobia behaviour among Nigerian undergraduate students .
- II. Students should be given equal opportunity and exposure to the techniques in addressing social phobia in schools, this will help improve the active participation in class participation and enhance teaching and learning process.

### Conclusion

Many studies have revealed that Social phobia is a fast growing phenomenon, which affect university undergraduate students. The global prevalence of Social phobia was found to be significantly higher with more than 10 million university undergraduates students in America. The symptoms of Social phobia did not differ between sexes but varied as a function of age, most of the problems stated above of social phobia are most likely to be manage by the self management techniques. The resultant effects of the situation coupled with some recommendations on how to tackled social phobia among undergraduate education in Nigeria using self management counselling technique

### References

- Adaka B.J & Hopman, G. (2015). *effect of Systematic desensitization in the treatment of SPD Among students of Federal College of Education Azare..* Unpublished M ed thesis Submitted to the School of postgraduate Studies. Bayero University, Kano.
- Anastasi. A.M (2015). Cognitive restructuring on social phobia Retrieved on <http://pro.psychcentral.com>.
- Akinade , E. (2015).*Principles of Cognitive Behavior Therapy*. Psych Central Retrieved from <http://pro.psychcentral.com>.
- Adam G.H, & Ammar N.J, (2013).*Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing
- Beck, A.S. (2018). *Cognitive Behavioral Therapy Basic and Beyond* (2<sup>nd</sup>ed).Gullford Press.

- Benga, S. (2016). *Effect of Self – Management Counselling Technique on Social Anxiety among Senior Secondary School Students of Gwale Local Government Kano, State* Unpublished Master Dissertation A.BU Zaria
- Clark DM, Wells A. (2019) *Social phobia: Diagnosis, assessment, and treatment*. New York
- Chapell, M.S., Blanding, M., Silverstein, B., Takahashi, M., Newman, M., Gubi, B., & McCann, A. (2015). Test Anxiety and Academic Performance in undergraduate and Graduate Students. *Journal of Educational Psychology*, Vol 97 No. 2 p268 – 274.
- Dombeck,N & Well M.S, (2017). *The Process and Delivery of Cognitive Behaviour Therapy (CBT)*, A Network Meta – Analysis.
- John. W. K, (1958). *A cognitive model of social phobia*; New York: Basic Books. Co Lmt
- Kande M.A, & Dommy N.G, (2014) Effect of self management technique and social skills training, for SPD among International Islamic University students of Malaysia (IIUM) *A journal of cognitive behavioural techniques*. Vo 1,No. 2 4(5), 757 – 775p.
- Kande, D.H (2015). Social skills and social phobia: An investigation of DSM-IV subtypes. *A journal of Behaviour Research and Therapy*, Vol. 5.No.1, 48, 992-1001p.
- Mitchel, S. A. (2019). Social anxiety and interpersonal perception: A social relations model analysis. *Behaviour Research and Therapy*, 41, 1355-1371.
- Mussen, C. A. (2013). The impact of systematic desensitization for social anxiety disorder: A randomized controlled trial. *Journal of anxiety disorders*, 28(8), 908-918.
- Musa,S.F, Garba , H.K Hamisu, B.L,& Maryam, A.M (2015).. Effectiveness of systematic desensitization training and Coping techniques of social anxiety disorder among Saadatu Rimi College of Education Kumbotso. *Journal of Nervous and Mental Disease*, Vo. 2 No. 1 173, 236–245
- Mc-Manus B. (2013). In-Depth: Cognitive Behavioural Therapy. Psch Central. Retrieved on from <http://psychcentral.com/lib/in-depth-cognitive-behavioural-therapy/000907>.
- Mitchel, M. J.; Conner, A. K (2014). What can we learn from the study of twins about genetic and environmental influences on interpersonal affiliation, aggressiveness, and social anxiety?: A meta-analytic study. *Communication Monographs*, 69, 1-18P

- Portia D.M, & Osuji. R.G,(2014).*Social Anxiety Scale: a comparison of the psychometric properties of self-report and clinician-administered formats.* unpublished M. ed Lecture Note University of Lagos
- Olamijir.G , & Oyodomoto.C ,(2014)“Effect of cognitive restructuring on lying tendency among secondary school students in Awka education zone,”*The Journal of Educational Psychologist, Vol. 3 No. 1, 10 (1), pp. 232-239,*
- Umar T, (2022). Counselling for successful retirement in nigeria; challenge and prospect Northwest journal of educational studies P 107-113 Retrieved from <https://dx.doi.org/10.13140/RG.2.2.13156.35200>
- Umar, T. Yunusa S, Ado M, (2021). Counselling strategy in the management of sepecial need Children in Nigeria Retrieved from <https://dx.doi.org/10.13140/RG.2.2.17376.87043>
- Umar, T. Lawan F.Z, (2021). Cross cultural counselling ; A challenge to counselling profession A.B.U Journal of educational psychology and counselling Retrieved from <https://dx.doi.org/10.13140/RG.2.2.32640.20487>
- Umar, T. Isah A.A, Muhammad M.A, (2021). Roles of guidance and counselling in the management of universal basic education in Nigeria Retrieved from 10.13140/RG.2.2.26184.90880
- Umar, T. Umar R.W, Bello A.I (2021). Theoretical Review of the Problems of Nigerian educational system from 2010-2020 *Gadau Journal of Education and Research* Retrieved from 10.13140/RG.2.2.13785.49766
- Umar T, Umar R.W,& Fatima L.Z (2022). Counsellors roles of equalizing educational Opportunities in Nigeria; *Psychology in Theory and Practice a festschrift in Hounor of Prof. Danjuma Abubaka Maiwada* Published online at <http://doi.org/10.5581/zenodo.818492>
- Vieira,& Matos. M., A. (2015), Social anxiety disorder: Questions and answers for the DSM-V. *Depression and Anxiety*, 27, 168-189. doi: 10.1002/da.20670
- Wolpe, J. (1958). Systematic Desensitization : A Confirmatory Factor Analysis of social Anxiety. *Research Article.* <https://doi.org/10.1177/0013164491511024>
- Well H.J Moran T.Y , A . (1965). *Reason and Emosion in psychology* ; London ; Routhledge and kegan paul.
- Wine,H.J (2019). What is Cognitive Behavior Therapy (CBT). A Psychologist explains: Retrieved from <https://positivepsychology.com> on 3/02/2022.

## **ROLE OF PHET INTERACTIVE SIMULATION AS VIRTUAL TECHNOLOGY THAT FACILITATES LEARNING OF CHEMISTRY: A SYSTEMATIC REVIEW OF CHEMICAL CONCEPTS, LEARNING THEORIES, INSTRUCTIONAL MODES AND STRATEGIES**

**\*<sup>1</sup>Hassan Aliyu, <sup>2</sup>Anas Abdullahi, & <sup>3</sup>Aliyu Garba**

<sup>\*1&3</sup>Department of Science Education,

Faculty of Education,

Sokoto State University, Sokoto

Email: [nagoronyo@gmail.com](mailto:nagoronyo@gmail.com)<sup>1</sup> & [aliyugarba.ag@gmail.com](mailto:aliyugarba.ag@gmail.com)<sup>2</sup>

ORCID: <https://orcid.org/0000-0003-4929-3126><sup>1</sup>

<sup>2</sup>Department of Computer Science,

Faculty of Science,

Sokoto State University, Sokoto

Email: [anas.abdullahi@ssu.edu.ng](mailto:anas.abdullahi@ssu.edu.ng)<sup>3</sup>

---

### **Abstract**

*Technology in the classroom is becoming increasingly prevalent, but many educators face challenges when integrating educational technology effectively. With the rapid growth of technological innovations, there are abundant opportunities to engage students in meaningful learning. Thus, for effective integration of technology in the classroom, teachers need to possess relevant technological pedagogical and content knowledge. The study investigated the predominantly employed instructional strategies used by educators when integrating PhET interactive simulations into the teaching and learning of chemical concepts. It also investigated the most learnt chemical concepts and psychological theories guiding the instructions designed by the educators across all levels of education. In order to address these objectives, the study adopted a systematic review of academic research published after the COVID-19 pandemic (2020-2024). After subjecting the obtained data to inclusion and exclusion criteria, 25 articles qualified for the study. The results indicated that the chemical processes/concepts learnt in the classroom with the aid of PhET interactive simulation include "physical chemistry," "chemical bonding," "Three State of Matter (solid, liquid, and gas)," "chemical equilibrium," "general chemistry," and "acid-base concept." It also reveals that the volumetric analysis of acid and base chemistry is the most learnt concept in the laboratory via interactive simulations. The findings also reveal that the predominant instructional strategies used for delivering instruction via PhET interactive simulations include inquiry, problem-based learning, project-based learning, discovery learning, and the Predict-Observe-Explain (POE) method. Finally, constructivism, cognitive load theory, Ausubel's theory of significant learning, and experiential learning theory are predominantly used theories guiding integration of PhET interactive simulation in the teaching and learning of chemistry. The study concluded that chemistry educators focus on using PhET interactive simulation in addressing difficulties in learning abstract concepts of chemistry, especially submicroscopic and microscopic chemical processes.*

**Keywords:** Chemistry, Balancing Chemical Equation, PhET Interactive Simulation, Virtual Learning, Instructional Strategies

## **Introduction**

Because of its adaptability and liveliness, interactive simulation is a powerful tool for conveying ideas, experiences, and activities to learners in a variety of scientific subjects where standard teaching and learning methods are ineffective. An individual can detect interactions that are unclear because of their temporal and spatial distance through the use of interactive simulation (Yassin, 2022). It is also defined by Peperkorn et al. (2024) as a method used by the teacher to clarify scientific facts by bringing the real world closer to the learners. It is a 21st-century tool that helps the student apply the lessons learned in similar scenarios in his life and saves time and effort when conducting experiments compared to real-life laboratories. Additionally, it has a big impact on how well students understand scientific terms and concepts, which increases the drive to improve achievement. Actually, the goal of the interactive simulations is to lessen students rote memorization culture (Rehman et al., 2021; Vandenplas et al., 2021). Thus, technology has made the teaching and learning process easier.

The University of Colorado Boulder is home to the PhET Interactive Simulations project, which was started in 2002 by Nobel Laureate Professor Carl Edwin Wieman ("PhET Interactive Simulations," 2023). PhET, which stands for "Physical Education Technology," is an abbreviation. Numerous audiences are served by its simulations, including faculty members, students in post-secondary education, students in elementary through high school, and even the general public. The simulations are made to work with the majority of hardware and software, such as Macintosh, Linux, and Microsoft Windows. Additionally, it provides operational flexibility, meaning it can be used offline or online.

It was stated that one of the reasons chemistry is such a tough subject to learn is that there are a lot of abstract concepts in it (Rahmawati et al., 2022; Salame & Makki, 2021). However, the contending issue is not only difficulty but also difficulty of learning, difficulty for learning, and difficulty in learning chemical concepts. The "difficulty for learning" concern is with the ability to create experience (previous knowledge) that would ease learning of the current chemical concept. Although chemical processes continuously occur around us, it is difficult to explain those processes in chemical terms because only the product of the whole process became obvious to us while the actual mechanisms that resulted in that product were invisible. It took decades before chemists realised the existence of unanimous chemical processes like conformation of substances, symmetry, isotopes, etc. To date, atomicity is taught to students using assumptions, imagination, and modelling, and this has been one of the causes of "difficulty in learning" about chemical processes. Many chemistry teachers tried integrating instructional aids that would facilitate both the teaching and learning of chemical processes. These aids include courseware (Talib, Aliyu, Malik, et al., 2018), instructional videos like dance chemistry (Talib et al., 2017), PowerPoint presentations (Mojica & Upmacis, 2022), documentaries, posters, interactive games (H. Aliyu et al., 2021), web-based resources (Talib, Aliyu, Ali, et al., 2018), virtual resources (Aliyu et al., 2021), etc.

Consequently, difficulty has not been the only issue, but even those learners who easily understand chemical processes misunderstand the chemical idea. Thus, misconception is

another critical issue that deters students understanding. Rahmawati et al. (2022), stated that the inability of students to make the connections between the symbolic, macroscopic, and sub-microscopic levels of comprehension in chemistry might lead to misconceptions. Understanding and being able to interact with the macroscopic, symbolic, and sub-microscopic levels of representation are necessary for chemistry. (Gong et al., 2023; Johnstone, 1991). Because of the student's inability to visualise sub-microscopic entities, interactions, and behaviours, the researchers were motivated to investigate the use of PhET Interactive Simulations to describe chemical processes.

### **Objectives of the Study**

Recently, chemistry education has undergone a revolution that embraces technologies to visualise mechanisms that trigger chemical processes. Although it started before the outbreak of COVID-19, the pandemic helped portray the benefits of virtual laboratories for learning chemistry to both teachers and learners. Today, after the pandemic, virtual laboratories are used all over the world because of their ability to present invisible components of chemical processes visually. Research continues to investigate the varying issues and successes recorded by chemistry teachers using interactive simulation tools after the COVID-19 pandemic. One of these virtual tools is the PhET interactive simulation. Thus, this study investigated the implications recorded by researchers when delivering chemistry instructions in the classroom and laboratory. The navigating points of the investigation include:

- I. To investigate the chemical processes/concepts that are predominantly learned in the classroom via a PhET interactive simulation
- II. To investigate the chemistry processes/concepts that are predominantly learned in the laboratory via PhET interactive simulation
- III. To find out the predominant instructional strategies used by researchers in integrating PhET interactive simulation into the teaching and learning of chemical concepts
- IV. To find out the predominant learning theories that guide researchers on the integration of PhET interactive simulation in the teaching and learning of chemistry
- V. To find out the benefit of integrating PhET interactive simulation in remote learning of chemical concepts

### **Research Questions**

The following are the research questions guiding the study:

- I. Which chemical processes/concepts are predominantly learned in the classroom via a PhET interactive simulation?
- II. Which chemical processes/concepts are predominantly learned in the laboratory via a PhET interactive simulation?



- III. What are the predominant instructional strategies used by researchers in integrating PhET interactive simulation into the teaching and learning of chemical concepts?
- IV. What are the predominant learning theories that guide researchers on the integration of PhET interactive simulation in the teaching and learning of chemistry?
- V. What are the benefits of integrating PhET interactive simulation in remote learning of chemical concepts?

## **Methodology**

The study assesses the role of PhET interactive simulation in chemistry education. It tries to address questions regarding the integration of PhET in the teaching and learning of chemical concepts in the classroom and laboratory; what is the implication of integrating PhET interactive simulation in chemistry education? Which concepts, methods, instructional strategies, and learning theories are predominantly used by chemistry teachers?. To answer these questions, the study employs a systematic review of related research components executed during and after the COVID-19 pandemic. It reviews studies conducted in the past five years, from 2020 to 2024. The review process includes a search of databases and journals, inclusion and exclusion criteria, and a final sample.

### ***Search from Database***

The search used electronic databases and journals with the keywords "PhET," "Physics Education Technology," "Chemistry," "Simulation," "Virtual Lab," "Virtual Laboratory," etc. This search was carried out on electronic media that publish quality research works globally. These electronic publishing media include, Journal of Chemical Education, Thinking Skills and Creativity Journal, Journal of Educational Research and Evaluation, Journal of Science and Education (JSE), International Journal of Creative Research Thought (IJCRT), Journal of Science Education and Technology, Royal Chemical Society, International Journal of Emerging Technologies in Learning (iJET), International Journal of Education in Mathematics, Science, and Technology (IJEMST), Journal of Science Education and Practice (JSEP), *Chimica didactica acta*, Jurnal Penelitian dan Pengembangan Pendidikan, Brazilian Journal of Education, Technology and Society (BRAJETS), International Journal for Research in Applied Science & Engineering Technology (IJRASET), Jurnal Pendidikan Sains (JPS), Interdisciplinary Journal of Environmental and Science Education, International Journal of Membrane Science and Technology, International Journal of Instruction, Google scholar, Scopus, Elsevier, Web of Science, Science Direct etc.

Over forty-seven thousand, two hundred and eighty-one (47,281) articles are obtained from the search results of all databases. This figure is extremely large, and it contains articles that may not cover chemistry or PhET simulation. Thus, there is a need for inclusion and exclusion criteria.

### ***Inclusion and Exclusion Criteria***

At this stage, researchers excluded any study that was not conducted under a chemical concept, was not delivered via interactive simulation, was conducted before the outbreak of COVID-19, was not published after a conference presentation, was a book chapter or book itself, or involved a single author. After executing these exclusion criteria, the

search result was reduced to two hundred and thirteen (2,013) articles. Consequently, some of the articles used simulation tools different from PhET, thus the need for inclusion criteria.

Studies of chemical concepts that employed PhET interactive simulations are the only articles included. This means that the focus is only on chemistry and interactive simulation. We obtained sixty-one (61) studies from these inclusion criteria.

### ***Final Sample***

In the end, the sixty-one (61) articles were subjected to thorough scrutiny, and studies that had content different from the title were excluded. Similarly, further exclusions include those articles that had no clear objectives or whose results did not address the stated objectives. Moreover, methodology holds a crucial place in every study as it increases the credibility of research by making the process transparent and reproducible. All studies whose methodology was not comprehensive and clear were excluded, focusing on only those articles that were rich in their content and appealing in their titles. The result of the whole search is twenty-three (23) articles. These articles are carefully and systematically reviewed to address the research questions of the study.

### **Result**

The role of PhET interactive simulation in facilitating and enhancing learning of secondary school science subjects (biology, chemistry, and physics) was perceived by many people all over the world recently. One of the most relevant examples of such awareness was demonstrated in the study conducted by Rahayu & Sartika (2020) to describe the influence of PhET Interactive Simulations on the motivation of learning and understanding the concept of natural science subject matter (like biology, chemistry, and physics). The researchers concluded that PhET Interactive Simulations affects the motivation and understanding of the concept of natural science in a positive manner. Similarly, Toma (2023) reported that Bangladesh science teachers recognised PhET simulations' potential as a supplement to hands-on activities for Bangladeshi secondary science education. The teachers believed that PhET simulations could enhance student learning and increase student interest and engagement in STEM education.



Table 1: Result of the search that qualified for analysis after exclusion and inclusion criteria

SN	Authors	Title of the article	Objectives	Sample	Chemical Concept	Method of teaching	Research Method	Result
1	Casa-coila et al. (2023b)	Model Chemlab and Phet Simulator: A Didactic Resource for Chemistry Learning in Undergraduate Students	To determine the incidence of the application of the Model Chemlab and PhET simulator as a didactic resource to improve learning achievement in the Chemistry Laboratory course in undergraduate students	sample of 14 students (6 women and 8 men)	Acid-Base by titration; Gravimetric analysis of chlorides etc.	Inquiry	pre-experimental design	The results showed a significant improvement, with a t-value of 17.393 and a significance level of $\rho=0.000$ these findings indicate that the students achieved an efficient use and management of the simulators, which favored their learning in the Chemistry Laboratory course
2	Efendi & Budi (2021)	The Effect of Distance Learning Practicum based on PhET Interactive Simulations on Science Process Skills of Secondary School Students	To describe the influence and significant influence of PhET Interactive Simulation-based distance practicum learning on the science process skills of junior high school students.	40 students JSS	Practical of physical chemistry	Interactive Simulation	Quasi-experimental Design	The result indicated that there is an influence of PhET interactive simulation-based distance practicum learning on the science process skills of junior high school students.
3	Toma (2023)	The Pedagogical Opportunities of PhET Interactive Simulations in Secondary Science Education in Bangladesh	To explores the challenges Bangladeshi teachers face in learning to implement PhET-enhanced pedagogies and examines teachers' views of the pedagogical opportunities for PhET simulations in secondary schools	129 students (42 in-service and 87 pre-service teachers)	Chemistry bonding structures	inquiry-based active learning approaches	explanatory mixed-method approach	Results suggested that teachers encountered several challenges when implementing PhET simulations: Inadequate Technological, Pedagogical, and Content Knowledge; Overcrowded Classrooms; Time Constraints, Teacher Workload, and Exam Pressure.
4	Lahlali et al. (2023)	The Effect of Integrating Interactive Simulations on the Development of Students' Motivation, Engagement, Interaction and School Results	To improve students' motivation, engagement, interaction and school results by integrating interactive simulations into the teaching-learning process of chemical bonding concepts	sample of 56 students	Chemical bonding	Interactive Simulation	Experimental	The results showed that students in the experimental group working with PhET interactive simulations scored significantly higher ( $p<.01$ ) than students in the control group after the post-test

5	Sebatana & Dudu (2023)	The Utilisation of Interactive Simulations in the Teaching and Learning of a Grade 10 Chemistry Topic: A Case in the North West province of South Africa	To utilize PhET interactive simulations in the teaching and learning of sub-microscopic behaviour of particles in Three States of Matter (TSM)	40 teachers	three state of matter (solids, liquid and gas) CHM	Guided Inquiry Learning	exploratory and interpretive case study	The result showed that, despite the advantages of PhET interactive simulations to promote conceptual understanding and allowing for the administration of TSM laboratory experiments, interactive simulations may result in misconceptions
6	Ouahi et al. (2021)	Opinions of Moroccan teachers towards the use of PhET simulations in teaching and learning physics – chemistry	To study the views of secondary and high school physics-chemistry teachers regarding the use of PhET(Physics Education Technology) simulations in the teaching and learning of students.	78 responses (38 middle schools and 40 high schools)	General Chemistry	Interactive Simulation	Qualitative research	The result of the survey reveals that most of the simulation tools teachers used are meant to help students develop understanding of chemical concepts through engagement in the scientific process. It also shows that interactive simulation is a flexible tool for learning chemistry
7	Taibu et al. (2021)	Using PhET simulations to improve scientific skills and attitudes of community college students	To explored the gain in students' scientific skills and perceptions of using PhET simulations	61 Students	Gas Properties	Collaborative inquiry-based	Mixed methods design	The result reveals that there is gain in lab skills by all participants. It also revealed considerable positive students' experiences of the PhET simulations (88% of students indicated positive satisfaction)
8	Rahmawati et al. (2022)	Students' Conceptual Understanding in Chemistry Learning using PhET Interactive Simulations	To analyse students' conceptual understanding of chemical equilibrium matter using Physics Education Technology (PhET) Interactive Simulations	108 students	Chemical equilibrium matter	Interactive Simulation	Quantitative research method	The analysis of interviews about chemical equilibrium showed that students had difficulty determining: (i) the effect of temperature on the equilibrium shift and the equilibrium constant and (ii) the catalyst's effect on the forward and the reverse reaction rates
9	Salame & Makki (2021)	Examining the Use of PhET Simulations on Students' Attitudes and Learning in General Chemistry II	To investigate the students' perceptions on the impact of PhET simulations on their learning and attitudes and to identify PhET's most helpful features	158 participants	General Chemistry II	Interactive Simulation	Survey	PhET interactive simulations have an overall positive impact on students' attitudes and perceptions about learning, and it promote and facilitate learning and understanding of abstract concepts, it furnish learning opportunities that otherwise cannot be attained in a

								traditional laboratory setting
10	Ulhaq et al. (2023)	The Effect of Using PhET Simulations Virtual Lab on the Understanding of the Acid-Base Concept	To investigate the impact of using the PhET virtual lab on chemistry education students' understanding of the acid-base concept	Population of 72, sampled 28 participants	Acid-base Concept	Interactive Simulation	Quasi-experimental approach with a one-shot case study	The result indicated that students responded positively to the use of the PhET virtual lab, with 41% rating it as good and 40% rating it as very good
11	Cruz et al. (2022)	Experimental Activities Using Virtual Simulators to Learn Chemistry During Covid-19 Pandemic	To learn physical properties of substances based on the type of chemical bonds and obtaining binary and ternary compounds.	Population of 188 students, sample 102 students	practical of physical chemistry	Interactive Simulation	Quantitative study	The results showed that the simulation works in a similar way to the experimental method, "despite operating at different cognitive levels
12	Rayan et al. (2023)	Integrating PhET Simulations into Elementary Science Education: A Qualitative Analysis	To evaluate how the use of these digital simulations influenced students' conceiving of scientific concepts, focusing on "States of Matter and Phase Changes" and "Solubility and Saturation"	observed 19 students	Matter and Phase Changes" and "Solubility and Saturation"	Interactive Simulation	Qualitative research approach	The result reveal that in the "Remembering" phase, students demonstrated a tendency to relate personal experiences to simulations, underscoring real-life context's role in learning; "Understanding" phase highlighted how PhET simulations facilitated deeper comprehension, with students making insightful observations; the "Application" phase showcased the effective translation of simulation-derived knowledge into practical scenarios, bridging theoretical and real-world understanding; and simulations supported Grade 3 students in their learning processes of scientific concepts



13	Gunawan et al. (2023)	Effectiveness of Deep PhET Interactive Simulation Improving Understanding of the Concept of Material Change	To evaluate the effectiveness of using PhET interactive simulations in increasing students' understanding of the concept of chemical material changes	60 students	Material Change - three state of matter (solids, liquid and gas)	Discovery Learning	Quasi-experimental design	The result illustrates the positive impact of using PhET simulations on improving student understanding
14	Gong et al. (2023b)	Unpacking Chemistry Teachers' Pedagogical Reasoning and Decisions for a PhET Simulation: A TPACK Perspective	To investigate how two chemistry teachers evaluated an interactive simulation and determined pedagogical strategies for integrating the simulation into classroom instruction	two participants	General Chemistry	Interactive Simulation	Comparative case study	It showed that pedagogical reasoning and decisions of the two participants reflected different TPACK components. One teacher mainly utilized TCK and evaluated the simulation from a designer's perspective while the other teacher leveraged TPACK and reasoned from a learner's perspective
15	Yaman & Hand (2024)	Exploring Conditions for Utilizing Representations in Chemistry in an Argument-Based Inquiry Environment: Laboratory Only, Technology Only, or a Combination of Laboratory and Technology	To examines how preservice science teachers (PSTs) use multiple levels of representation in chemistry (macroscopic, microscopic, symbolic, and algebraic) as a result of engaging in argument-based inquiry in three different conditions: laboratory-only, technology-only, and a combination of technology and laboratory	20 PSTs	Acid and base chemistry	Inquiry	Single-case study design	The results reveal that the PSTs prefer engaging in the combination of laboratory and technology conditions in terms of representational use, with this condition being the most beneficial in promoting development of representational competency
16	Vandenplas et al. (2021)	Use of Simulations and Screencasts to Increase Student Understanding of Energy Concepts in Bonding	To investigate the use of simulations alone, versus the use of simulations incorporated into screencasts, for the teaching and learning of energy changes at the atomic–molecular level	24 students	Force and energy in bonding and intermolecular attractions	Flipped, blended, and online learning	Experimental	The result revealed that the enhanced screencast was able to help students better connect this concept to the phenomena of ATP hydrolysis
17	Dantic & Fularon (2022)	PhET interactive simulation approach in teaching electricity and magnetism	To assess the students' conceptual knowledge in electricity, magnetism, and their perspectives on the	14 preservice science teacher	Electrons in Electricity	Interactive Simulation	Qualitative design	The results have revealed that the conceptual knowledge in Electricity and Magnetism improved to very satisfactory after the application of intervention

		among science teacher education students	effects of the PhET Simulation Approach in teaching the said concepts.					
18	Parthiban & Leo (2024)	Enhancing the Science Process Skills through Phet Simulation	To understand the science process skills among IX standard students with respect to PhET simulation	30 Students	Chemical bonding	Interactive Simulation	Single group design	The result indicated that the level the achievement of science process skills through PhET simulation in posttest is higher than that of Pre-test
19	Cruz et al. (2022)	Experimental Activities using Virtual Simulators to Learn Chemistry During COVID-19 Pandemic	To evaluate the effectiveness of three virtual resources: PhET, Crocodile Chemistry605 and Yenka in learning General Chemistry, Inorganic Chemistry and Chemical Physics	188 students (102 students)	General Chemistry, Inorganic Chemistry and Chemical Physics	Interactive Simulation	quasi-experimental design	The results show that the activities carried out motivate students to inquire about the contents covered in class, stimulate their participation in the development of activities, but above all contribute to the interpretation of conceptual and procedural contents of the subjects developed in the area of Chemistry
20	Haryanto et al. (2024)	Generic Science Skills: PhET Applications Based On Discovery Learning	To assess the conceptual, procedural feasibility, and efficacy of a groundbreaking educational intervention, the Discovery Learning model-teaching module infused with the innovative PhET application aimed at enhancing students' generic skills proficiency in the domain of chemistry.	60 students and 15 teachers	General Chemistry	Discovery Learning	development method, known as Research and Development (R&D)	The result reveals that the PhET interactive simulation when integrated with discovery learning approach exhibits exceptional validity and practicality and yields tangible improvements in students' generic chemistry science skills.
21	Faizah et al. (2024)	Student Acceptance Study of PhET Simulation with an Expanded Technology Acceptance Model Approach	To assess level of acceptance of PhET interactive simulation on problem-based learning	49 students	General Chemistry	Problem-Based Learning	Quantitative design with a descriptive, explanatory type	The result showed that system quality has an effect on perceived usefulness, perceived ease of use has an effect on behavioral intention of use, behavioral intention of use has an effect on actual usage, and there is no relationship between instructor quality on perceived usefulness

22	Komang et al. (2023)	Problem Based Learning Model Assisted by PhET Interactive Simulation Improves Critical Thinking Skills of Elementary School Students	To analyze the effect of the Problem Based Learning model assisted by the phET application on electricity learning materials	Population totaled 192 students, samples is 35 students	Electrons in electricity	Problem Based Learning	quasi-experimental Design	The result indicated that Problem-based Learning assisted by the PhET application could improve the critical thinking ability of fourth grade elementary school students in electricity material
23	Juwairiah et al. (2022)	Digitization of laboratory equipment using PhET simulation media in applied chemistry practicum	To describe the use of PhET Simulation in acid-base practicum,	32 students of State Polytechnic of Creative Media PSDKU	Acid-base practicum of Applied Chemistry	Interactive Simulation	Descriptive method that	Results showed that the application of PhET media was effective in acid and base practicum. Based on student assessments after learning, it was found that students were very happy to learn by using PhET media.

After thorough exclusion and inclusion screening criteria, Table 1 indicated that only 23 articles contain rich information that will be valuable in answering the research question of the study. Although many authors used PhET interactive simulation in 2020, none of their research qualified for the analysis of this study. Consequently, five (5) published articles of 2021 and 2022 each qualified; nine (9) in 2023; and four (4) in 2024 also qualified. The key components of academic research focused by this study include the objective of the study, research methodology, instructional strategies, chemical concept, sample, and the result of the study. All qualified studies aligned their objectives with the methodology, and the findings are reported in a comprehensive and clear manner.

During screening of searched results, authors observed that other interesting studies are conducted in the other areas of science. For example, Efendi & Budi (2021) conducted a study to describe the influence and significant influence of PhET interactive simulation-based distance practicum learning on the science process skills of junior high school students. The study reveals that there is an influence of PhET interactive simulation-based distance practicum learning on the science process skills of junior high school students. It concluded that there is a massive influence between PhET-based remote practicum learning interactive simulations on the science process skills of junior high school students in science subjects. Similarly, Yulianti et al. (2021) used an eight-step guided inquiry framework to explore the description of the guided inquiry learning stages using PhET simulation to train students' critical thinking on vibration and wave topics. These stages are (i) open, (ii) immerse, (iii) explore, (iv) identify, (v) gather, (vi) create, (vii) share, and (viii) evaluate. Twenty-five (25) students were used as the participants of the study. According to researchers, most students were interested in and paid attention to learning starting from the pre-opening to the end. The result indicated that students were able to gain a correct conceptual understanding of classical wave phenomena, which furthermore will make it easier for them to learn more advanced topics, such as quantum physics, in the future.

In order to address research questions, results are presented in a systematic manner that describes each component of the research. The implication of the PhET interactive simulation in teaching and learning of chemical concepts is the first focal point of the study. These implication could come in different manners, but for this study we consider the implication of PhET in teaching and learning of chemical concepts itself, pedagogical approaches implemented for classroom instruction, learning theories, laboratory instruction, and remote learning.

***Research Question one: Which chemical processes/concepts are predominantly learned in the classroom via a PhET interactive simulation?***

The popular basic chemical concepts include matter, material; solid, liquid, gas, vapour, mixture, substance, solution, solvent, solute; physical physicochemical, chemical, radiochemical, element, compound, allotropy, periodicity, bonding, reaction, electrolysis, electrolytic cell, stoichiometric, nonstoichiometric molecular concepts, atomic and kinetic point of views etc. These formulated the entire macroscopic, sub microscopic, and symbolic level of representation of chemical concepts.

**Table 2:** Chemical processes/concepts that are predominantly learned in the classroom via a PhET interactive simulation

SN	Researchers	Research Objective	Chemical Concept
1	Casa-coila et al. (2023)	to determine the incidence in which application of those simulators could improve learning achievement in the Chemistry Laboratory course	Physical Chemistry
2	Lahlali et al. (2023)	to understand and relate both chemical systems and what is happening at the sub-microscopic level from the dynamic visualisation, and helps students to overcome learning difficulties and improve academic performance	Chemical Bonding
3	Toma (2023)	to explores the challenges Bangladeshi teachers face in learning to implement PhET with enhanced pedagogies and examines teachers' views of the pedagogical opportunities for PhET simulations in secondary schools.	Chemical Bonding
4	Sebatana & Dudu (2023)	to promote conceptual understanding and allowing for the administration of three state matter (solid, liquid and gas) laboratory experiments, interactive simulations may result in misconceptions.	Three State of Matter (solid, liquid and gas)
5	Rahmawati et al. (2022)	to analyse students' conceptual understanding of chemical equilibrium matter using Physics Education Technology (PhET) Interactive Simulations	Chemical equilibrium
6	Salame & Makki (2021)	to investigate the students' perceptions on the impact of PhET simulations on their learning and attitudes and to identify PhET's most helpful features	General Chemistry
7	Ulhaq et al., (2023)	to investigate the impact of using the PhET virtual lab on chemistry education students' understanding of the acid-base concept	Acid-base Concept
8	Patricia & Cruz, (2022)	to learn physical properties of substances based on the type of chemical bonds and obtaining binary and ternary compounds.	Physical chemistry
9	Rayan et al. (2023)	to evaluate how the use of these digital simulations influenced students' conceiving of scientific concepts, focusing on "States of Matter and Phase Changes" and "Solubility and Saturation"	States of Matter and Phase Changes" and "Solubility and Saturation"
10	Gunawan et al. (2023)	to evaluate the effectiveness of using PhET interactive simulations in increasing students' understanding of the concept of chemical material changes	Material Change – three state of matter (solids, liquid and gas)

Table 2 indicated that some of the chemical processes/concepts learned in the classroom with the aid of PhET interactive simulation include “physical chemistry” (Casa-coila et al., 2023 and Patricia & Cruz, 2022), “chemical bonding” (Lahlali et al., 2023 and Toma, 2023), “Three State of Matter (solid, liquid and gas)” (Gunawan et al., 2023; Rayan et al., 2023 and Sebatana & Dudu, 2023), “chemical equilibrium” (Rahmawati et al., 2022), “general chemistry” (Salame & Makki, 2021), and “acid-base concept” (Ulhaq et al., 2023). Thus, the most learned concept is three states of matter is part of general chemistry.

***Research Question two: which chemical processes/concepts are predominantly learned in the laboratory via a PhET interactive simulation?***

According to Patricia & Cruz (2022) laboratory practice constitutes a powerful pedagogical strategy for the construction of conceptual, procedural, and even attitudinal competencies. Chemistry teachers need to understand that thoughtfully designed chemistry laboratories enhance the chemistry experience, practical skills, scientific skills, and general skills vital to any student of science (Tran et al., 2020). Researchers (indicated in Table 3) used PhET simulations to investigate or facilitate learning of chemical concepts in the laboratories.

**Table 3:** Chemical processes/concepts learned predominantly in the laboratory via PhET interactive Simulations

SN	Researchers	Objective of their Research	Practical Concepts
1	Casa-coila et al. (2023)	To determine the incidence in which application of those simulators could improve learning achievement in the Chemistry Laboratory course	Acid-Base by titration; Gravimetric analysis of chlorides etc.
2	Salame & Makki (2021)	To investigate the students' perceptions on the impact of PhET simulations on their learning and attitudes and to identify PhET's most helpful features.	General Chemistry II
3	Patricia & Cruz (2022)	To learn physical properties of substances based on the type of chemical bonds and obtaining binary and ternary compounds.	Physical chemistry
4	Yaman & Hand (2024)	To examines how preservice science teachers (PSTs) use multiple levels of representation in chemistry (macroscopic, microscopic, symbolic, and algebraic) as a result of engaging in argument-based inquiry in three different conditions: laboratory-only, technology-only, and a combination of technology and laboratory	Acid and base chemistry
5	Dukes (2020)	To move the laboratory portion of our Instrumental Analysis course to an online instruction format	absorption spectroscopy measurement
6	Juwairiah et al.	To describe the use of PhET	acid-base practicum



(2022)	Simulation, knowing the effectiveness of using PhET Simulation media in acid-base practicum, knowing the advantages and disadvantages of using PhET Simulation in acid-base practicum, and the purpose of this study was to see student learning outcomes after the application of PhET media in learning.	Applied Chemistry
--------	--	-------------------

It can be seen from Table 3 that researchers (Casa-coila et al., 2023; Dukes, 2020; Juwairiah et al., 2022; Patricia & Cruz, 2022; Salame & Makki, 2021; Yaman & Hand, 2024) used PhET simulations to investigate or facilitate teaching and learning of chemical concepts in the laboratories, depending on the objective of the researchers. Moreover, it reveals that volumetric analysis of acid-base chemistry is the most learned chemical concepts in the laboratory via PhET interactive simulations.

**Research Question three: What are the predominant instructional strategies used by researchers in integrating PhET interactive simulation into the teaching and learning of chemical concepts?**

**Table 4:** Instructional strategies used by researchers in integrating PhET interactive simulation into the teaching and learning of chemical concepts

SN	Researchers	Objective of their Research	Instructional Strategies
1	Komang et al. (2023)	to nalyse the effect of the Problem Based Learning model assisted by the PhET application on electricity learning materials	Problem Based Learning
2	Yulianti et al. (2021)	to explore the stages of inquiry learning approach using PhET, especially on training them to attain their critical thinking skill.	Inquiry-Based Learning
3	Toma (2023)	to explores the challenges Bangladeshi teachers face in learning to implement PhET-enhanced pedagogies and examines teachers' views of the pedagogical opportunities for PhET simulations in secondary schools	Inquiry-Based Learning
4	Makamu and Ramnarain (2022)	To investigate the pedagogical actions of physical sciences teachers when enacting simulations in 5E inquiry-based science teaching for current electricity	5E Inquiry-Based Learning
5	Siswoyo & Mulyati (2021)	to identify students' responses of how they nalyse the relationship between forces and changes in kinetic energy in objects moving in horizontal field	Inquiry-Based Learning
6	Sebatana & Dudu (2023)	to utilise PhET interactive simulations in the teaching and learning of sub-microscopic behaviour of particles in Three States of Matter (TSM)	Guided inquiry
7	Taibu et al.	to explored the gain in students' scientific skills	Collaborative

	(2021)	and perceptions of using PhET simulations	inquiry-based
8	Alfiyanti and Jatmiko (2020)	To assess the effectiveness of the POE model with PhET simulations in enhancing critical thinking skills of senior high school students in Indonesia was investigated	Predict-Observe-Explain (POE) method
9	Çetinkaya and Kırılmazkaya (2022)	explored POE's effect on students' attitudes toward science by reducing students' misconceptions of the concept of greenhouse effect	Predict-Observe-Explain (POE) method
10	Sebatana & Dudu (2023)	to utilise PhET interactive simulations in the teaching and learning of sub-microscopic behaviour of particles in three states of matter (TSM)	Project-Based Learning
11	Gunawan et al. (2023)	to evaluate the effectiveness of using PhET interactive simulations in increasing students' understanding of the concept of chemical material changes	Discovery learning
12	Yaman & Hand (2024)	examines how preservice science teachers (PSTs) use multiple levels of representation in chemistry (macroscopic, microscopic, symbolic, and algebraic) as a result of engaging in argument-based inquiry in three different conditions: laboratory-only, technology-only, and a combination of technology and laboratory	Inquiry
13	Haryanto et al. (2024)	to assess the conceptual, procedural feasibility, and efficacy of a groundbreaking educational intervention, the Discovery Learning model teaching module infused with the innovative PhET application aimed at enhancing students' generic skills proficiency in the domain of chemistry.	Discovery learning
14	Faizah et al. (2024)	to assess level of acceptance of PhET interactive simulation on problem-based learning	Problem-Based Learning

Table 4 represented various instructional strategies used for integrating interactive simulation into teaching and learning of chemical concepts. It has been revealed that the most predominant instructional strategies are “inquiry” (Bonny, 2022; Makamu & Ramnarain, 2022; Siswoyo & Mulyati, 2021; Taibu et al., 2021; Toma, 2023; Yaman & Hand, 2024; Yulianti et al., 2021), “problem-based learning” (Faizah et al., 2024; Komang et al., 2023), “discovery learning” (Gunawan et al., 2023; Haryanto et al., 2024), “project-based learning” (Sebatana & Dudu, 2023), “predict-observe-explain (POE) method” (Alfiyanti & Jatmiko, 2020; and Çetinkaya & Kırılmazkaya, 2022). It indicated that the predominantly used instructional strategies include inquiry, problem-based learning, project-based learning, discovery learning, and Predict-Observe-Explain (POE) method.

**Research Question four: What are the predominant learning theories that guide researchers on the integration of PhET interactive simulation in the teaching and learning of chemistry?**

**Table 5:** Learning theories used by researchers in implementing PhET Simulation in Chemistry

SN	Researchers	Objective of their Research	Learning Theories
1	Sebatana & Dudu (2023)	To utilise PhET interactive simulations in the teaching and learning of sub-microscopic behaviour of particles in three states of matter (TSM)	Experiential learning theory
2	Taibu et al. (2021)	To explored the gain in students' scientific skills and perceptions of using PhET simulations	Constructivism
3	Patricia & Cruz (2022)	To learn physical properties of substances based on the type of chemical bonds and obtaining binary and ternary compounds	Ausubel's theory of meaningful learning
4	Vandenplas et al. (2021)	To investigate the use of simulations alone, versus the use of simulations incorporated into screen-casts, for the teaching and learning of energy changes at the atomic–molecular level	Cognitive Load Theory
5	Cruz et al. (2022)	To evaluate the effectiveness of three virtual resources: PhET, Crocodile Chemistry605 and Yenka in learning General Chemistry, Inorganic Chemistry and Chemical Physics	Ausubel's theory of significant learning

It can be observed from Table 5 that the predominant Psychological theories used by the researchers in integrating interactive simulations in teaching and learning of chemistry include “constructivism” (Taibu et al., 2021), “cognitive load theory” (Eichler, 2022 and Vandenplas et al., 2021), “Ausubel's theory of significant learning” (Cruz et al., 2022), and “experiential learning theory” (Sebatana & Dudu, 2023).

**Research Question five: What are the benefits of integrating PhET interactive simulation in remote learning of chemical concepts?**

The use of simulations in chemistry courses has become more frequent, and using them outside of the classroom in an online environment is one mechanism to provide active engagement with concept development at the atomic–molecular level (Vandenplas et al., 2021). Thus, the ability for classes to continue in a remote learning environment would not have been possible without innovative technology. Initially, issues arose due to lack of computers, limitations on sharing computers with other family members, and low-bandwidth internet (Emenike et al., 2020). During COVID-19 lockdown some institutions had to create emergency students funds to so that they could distribute laptops to those in need (Emenike et al., 2020), more training was provided to teachers

**Table 6:** Benefits of integrating PhET interactive simulation in remote learning of chemical concepts

SN	Researchers	Benefit	Frequency	Percentage
1	Juwairiah et al. (2022) and Sebatana & Dudu (2023)	enhanced student's interest	2	7.1%
2	Vandenplas et al. (2021)	Connect student's experience	1	3.6%
3	Faizah et al. (2024)	perceived usefulness, perceived ease of use	1	3.6%
4	Endrayani et al. (2022); Efendi & Budi (2021); Haryanto et al. (2024); Parthiban & Leo (2024); Taibu et al. (2021)	enhance students' science process skills	4	14.3%
5	Cruz et al. (2022); Cruz et al. (2022)	motivate students	2	7.1%
6	Casa-coila et al. (2023); Nizar et al. (2022); Yassin (2022)	improve academic achievement	3	10.7%
7	Ouahi et al. (2021); Yaman & Hand (2024)	enhanced students' engagement	2	7.1%
8	Dantic & Fularon (2022); Gunawan et al. (2023) Ouahi et al. (2021); Rayan et al., (2023); Rehman et al. (2021); Salame & Makki (2021); Sebatana & Dudu (2023)	improving student conceptual understanding	7	25.0%
9	Komang et al. (2023)	improve critical thinking ability	1	3.6%
10	Yassin, (2022); Lahlali et al. (2023)	enhanced students' academic performance	2	7.1%
11	Salame & Makki, 2021	yield positive impact on students' attitudes and perceptions about learning	1	3.6%
12	Ulhaq et al. (2023)	yield positive development in learning	2	7.1%
<b>Total</b>			<b>28</b>	<b>100%</b>

It can be observed from Table 6 that researchers reported several benefits of integrating PhET interactive simulation in remote learning of chemical concepts including that, it help students better connect their experience with the chemical concepts (Vandenplas et al., 2021); enhanced student's interest (Juwairiah et al., 2022; Sebatana & Dudu, 2023); perceived usefulness, perceived ease of use (Faizah et al., 2024); enhance students'

science process skills (Efendi & Budi, 2021; Haryanto et al., 2024; Parthiban & Leo, 2024; Taibu et al., 2021); motivate students (Cruz et al., 2022; Patricia & Cruz, 2022); improve academic achievement (Casa-coila et al., 2023; Nizar et al., 2022; Yassin, 2022); enhanced students' engagement (Ouahi et al., 2021; Yaman & Hand, 2024); improving student conceptual understanding (Dantic & Fularon, 2022; Gunawan et al., 2023; Ouahi et al., 2021; Rayan et al., 2023; Rehman et al., 2021; Salame & Makki, 2021; Sebatana & Dudu); improved student's learning (Banda & Nzabahimana, 2023); enhanced problem-solving (Patricia & Cruz, 2022); enhanced students cognitive ability (Patricia & Cruz, 2022); yield positive development in learning (Ulhaq et al., 2023); yield positive impact on students' attitudes and perceptions about learning (Salame & Makki, 2021); enhanced students' academic performance (Ali & Yassin 2021; Lahlali et al., 2023); improve critical thinking ability (Komang et. Al, 2023). The most reported benefits of integrating PhET interactive simulation in remote learning of chemical concepts is that it “improve student conceptual understanding” which represented 25% of the benefits recorded.

## Discussion

The study executed systematic review of related articles that represented the integration of interactive simulations for facilitating teaching and learning of chemistry. After thorough exclusion and inclusion, qualified articles are reviewed and the results are discussed in the following subsections thereby addressing research questions of the study.

### *Predominant chemical processes/concepts learned in the classroom with the aid of PhET interactive simulation*

As indicated in Table 2, some of the chemical processes/concepts learned in the classroom with the aid of PhET interactive simulation include “physical chemistry”, “chemical bonding”, “Three State of Matter (solid, liquid and gas)”, “chemical equilibrium”, “general chemistry”, and “acid-base concept”. These concepts are among the fundamental processes that understanding them lead to the understanding of other more complex concepts. Out of all the components of chemistry curriculum (physical, general, organic, inorganic, analytical, environmental, etc.) physical and general chemistry are the predominantly learned concepts in the classroom via interactive simulations. These mean that all learned concepts (three states of matter, chemical equilibrium, acid-base chemistry, chemical bonding) falls within the category of physical and general chemistry.

#### **a. Physical Chemistry**

The study of matter's behavior at the atomic or molecular level is the focus of physical chemistry. It also involves the study of the properties of substances at different scales, from the macroscopic scale, which includes particles that are visible to the naked eye, to the subatomic scale, involving extremely small subatomic particles, such as electrons. This area of chemistry employs the concepts and principles of physics to understand chemical systems and reactions. Patricia & Cruz (2022) guide their 102 students to learn physical properties of substances based on the type of chemical bonds and obtaining binary and ternary compounds using PhET interactive simulation. The findings of this action study conducted by Patricia & Cruz (2022) reveals that students fully agree that the use of simulators motivated the development of their skills, encouraged the development of strategies to solve theoretical and practical problems, and fostered a learning environment with meaningful, relevant experiences and constant feedback.

However, from the findings of the study, it is obvious that the three states of matter can be understood to be a concept found in the physical branch of chemistry. To be precise, the three primary states of matter are the solid, liquid, and gaseous states. These three forms of matter can be converted from one state of matter to another state by changing certain environmental factors (increasing or decreasing pressure and temperature, for instance). According to Sebatana & Dudu (2023), three states of matter is the only topic in Grade 10 Physical Sciences that requires practical laboratory experiments (a heating curve) and is assessed as a formal task that contributes 25% to learners' pass mark in first term. It involves solid, liquid and gas, and their observable features can be difficult to understand, resulting in both teaching and learning challenges. Specifically, what makes this topic difficult is the sub-microscopic level of particles, since it is invisible. Sebatana & Dudu (2023), report that despite the advantages of PhET interactive simulations to promote conceptual understanding and allowing for the administration of three state matter (solid, liquid and gas) laboratory experiments, interactive simulations may result in misconceptions. The authors suggested that PhET interactive simulations should be utilised for effective teaching and learning of abstract concepts and conceptual understanding of sub-microscopic behaviour of particles in three states of matter (solid, liquid and gas).

Other authors that utilized PhET interactive simulation to facilitate learning of three states of matter include: Rayan et al. (2023) who evaluated how the use of these digital simulations influenced students' conceiving of scientific concepts, focusing on "States of Matter and Phase Changes" and "Solubility and Saturation"; and Gunawan et al. (2023) who also evaluated the effectiveness of using PhET interactive simulations in increasing students' understanding of the concept of chemical material changes.

#### **b. General Chemistry**

General chemistry is the study of matter, energy, and the interactions between the two. The main topics in chemistry include the gas phase, acids and bases, solutions (solubility), atomic structure, thermochemistry, electrochemistry, periodic table, equilibrium, chemical bonds, chemical kinetics, stoichiometry, and chemical reactions. The finding of the study reveals that while some authors (Salame & Makki, 2021) use PhET simulation to teach the whole of general chemistry, others (Lahlali et al., 2023; Rahmawati et al., 2022; Toma, 2023; and Ulhaq et al., 2023) teach some components of general chemistry (chemical bonding, equilibrium, acid-base chemistry etc.) via interactive simulation. For example, in a redox reactions, Salame & Makki (2021), uses PhET simulations as part of their laboratory sessions of teaching general chemistry II in City College of New York, an urban, minority serving, and public college. The researchers use 158 participants to investigate the students' perceptions on the impact of PhET simulations on their learning and attitudes and to identify PhET's most helpful features. The general finding of the study are that PhET interactive simulations have an overall positive impact on students' attitudes and perceptions about learning, PhET simulations promote students' development of conceptual understanding of chemistry concepts and content, PhET simulations seem to promote and facilitate learning and understanding of abstract concepts, and PhET simulations furnish learning opportunities that otherwise cannot be attained in a traditional laboratory setting.

For the chemical bonding, the results of the study conducted by Lahlali et al. (2023) suggest that the teaching-learning of chemistry topics related to chemical bonding can be



enhanced using PhET interactive simulations combined with molecular models. The researchers suggested the use of this simulation also allows students to understand and relate both chemical systems and what is happening at the sub-microscopic level from the dynamic visualisation, and helps students to overcome learning difficulties and improve academic performance. Lahlali et al. (2023), reported that the rate of student interaction between peers and with the teacher during the teaching-learning process after the integration of PhET interactive simulations is higher than before the integration of PhET, which mean that the simulation stimulation students' curiosity, engagement and collaboration in learning.

Chemical bonding and structures was also studied by Toma (2023) to explore the challenges Bangladeshi teachers face in learning to implement PhET with enhanced pedagogies and examines teachers' views of the pedagogical opportunities for PhET simulations in secondary schools.

For the equilibrium, Rahmawati et al. (2022), used interactive simulation to analyse students' conceptual understanding of chemical equilibrium matter using Physics Education Technology (PhET) Interactive Simulations. Three basic problems form the reason for the study according to the researchers. These include: students have difficulty connecting sub-microscopic, macroscopic, and symbolic level; students have different prior knowledge based on their everyday life experiences and perceive this as a scientifically acceptable concept; and students have difficulty visualising the chemical equilibrium system as well. Researcher reported that some common misconceptions that experienced by students in equilibrium reactions are that the reaction will occur after all reactants have reacted such as irreversible reaction; some even thought that no reaction occurs in the equilibrium system; increasing the concentration of the reactants will form more reactants; addition of solvents, such as water, will not affect the equilibrium shift. Students did not understand the meaning of enthalpy in the reaction equation and temperature given to the system; they ignored any temperature changes that could impact the distribution of the product and reactant molecules.

For the acid-base chemistry, Ulhaq et al., (2023) used interactive simulation to investigate the impact of using the PhET virtual lab on chemistry education students' understanding of the acid-base concept. About 28 individuals participated in this quasi-experimental approach where a one-shot case study followed by a post-test. The findings suggested that the implementation of PhET Simulation can facilitate students in understanding the concepts of acid-base materials.

### ***Chemical processes/concepts are predominantly learned in the laboratory via a PhET interactive simulation***

The findings of the study reveals that chemical concepts like volumetric analysis of acid & base (Casa-coila et al., 2023; Juwairiah et al., 2022; Yaman & Hand, 2024), Gravimetric analysis of chlorides, absorption spectroscopy measurement (Dukes, 2020), general chemistry II (Salame & Makki, 2021) and physical chemistry (Patricia & Cruz, 2022) are some of the processes learned in the laboratory via interactive simulations. However, the results of the study reveals that the volumetric analysis of acid & base chemistry is the most learned concept in the laboratory via interactive simulations. These findings are obvious because, Casa-coila et al. (2023) use Model Chemlab and PhET Simulator to determine the incidence in which application of those simulators could improve learning achievement in the Chemistry Laboratory course. Moreover, they use

14 undergraduate students to study volumetric analysis of chemistry practical in nine (9) learning sessions. No instructional approach was indicated by the authors, but the results showed a significant improvement which indicate that the students achieved an efficient scores that favoured their learning in the Chemistry Laboratory course. According to Casa-coila et al. (2023), the application of active experimental strategies is an active learning method that stimulates students to develop competencies through interactions, using simulators in laboratory classrooms.

Juwairiah et al. (2022) uses 32 students of State Polytechnic of Creative Media PSDKU to describe the use of PhET Simulation, knowing the effectiveness of using PhET Simulation media in acid-base practicum, knowing the advantages and disadvantages of using PhET Simulation in acid-base practicum, and the purpose of this study was to see student learning outcomes after the application of PhET media in learning. The results showed that the application of PhET media was effective in acid and base practicum. Based on student assessments after learning, it was found that students were very happy to learn by using PhET media.

Consequently, as an alternative to didactic resource to teach students to learn the practical of physical chemistry, Patricia & Cruz (2022) uses PhET simulator and the virtual laboratories Crocodile Chemistry605 and Yenka to learn physical properties of substances based on the type of chemical bonds and obtaining binary and ternary compounds. The study reviewed properties of gases and their laws (Boyle, Charles and Gay Lussac).

### ***Predominant instructional strategies used by researchers in integrating PhET interactive simulation into the teaching and learning of chemical concepts***

Technology in the classroom is becoming increasingly prevalent, but many educators face challenges when integrating educational technology effectively (Toma, 2023). With the rapid growth of technological innovations, there are abundant opportunities to engage students in meaningful learning. Thus, for effective integration of technology in the classroom, teachers need to possess relevant technological pedagogical and content knowledge. According to Ulhaq et al. (2023), PhET simulations bridge the gap between theoretical concepts and real-world application.

The findings of the study reveal that the predominant instructional strategies used for delivering instruction via PhET interactive simulations include inquiry, problem-based learning, project-based learning, discovery learning, and Predict-Observe-Explain (POE) method. Interestingly, the pedagogical advantages of PhET simulations in improving the visualization of abstract scientific concepts have been reported by many researchers (Correia et al., 2019; Price et al., 2019; Salame & Makki, 2021). But, this and other benefits can be achieved only when PhET simulations coupled with appropriate instructional approaches (Toma, 2023). The use of improper instructional strategies has been identified as a significant factor that may hinder the effective use of PhET simulations in the classroom or laboratory (Ouahi et al., 2022). According to Toma (2023), researchers suggested that lecture and guided inquiry are specific strategies that are best suited to PhET simulations. Some of them explored how POE (Predict-Observe-Explain), 5E (Engage-Explore-Explain-Elaborate-Evaluate), and CCL (Collaborative Creativity Learning) models can be used with PhET simulations.

Some researchers (Prima et al., 2018; Toma, 2023) found that students who learn scientific concepts with PhET simulations performed significantly better across four

cognitive domains: remembering, understanding, applying, and analysing. Moreover, in an attempt to identify and discuss the views of teachers of physics-chemistry (Ph-Ch) and Life and Earth Sciences (LES) on the use and effectiveness of interactive simulations PhET in student teaching and learning Ouahi et al. (2022) resolved that the use of interactive simulations in investigative science teaching and learning is very effective for both teachers and students, despite the presence of a set of obstacles that hinder the use of classroom simulations.

#### **a. Problem-based Learning**

The problem-based learning was used by Faizah et al. (2024) and Komang et al. (2023) to facilitate instruction in a simulation environment. Problem-based learning (PBL) is a pedagogy that uses real-world problems to direct students towards the learning objectives of a course. It is an instructional method helps students to use open-inquiry approach in learning to apply scientific knowledge in real life situations unlike the traditional method where students become passive in the teaching process that does not promote problem-solving and cognitive skills. Solving the problems requires that students build upon their background knowledge and gain new subject knowledge of the material that they have not yet studied. They gain this knowledge on a need to know basis in order to solve the problem. Thus, it was reported that PhET application-assisted problem-based learning enhances critical thinking ability (Komang et al., 2023).

#### **b. Inquiry-Based Learning approaches**

Inquiry-based learning has been used by chemistry teachers (Tran et al., 2020) for decades to deliver effective instructions in the classroom, laboratory or even remote locations. Yulianti et al. (2021), reports that students' critical thinking abilities increase during the implementation of the guided inquiry model in learning. The authors used the nine-step guided inquiry framework (pre-opening, opening, immerse, explore, identify, gather, create, share, evaluate) designed by Kuhlthau et al. (2012) with 25 Indonesian junior high school students. They found out that using PhET simulations in a guided inquiry learning model that emphasized critical thinking helped students acquire the following concepts: wave speed, wavelength, and wave frequency.

Similarly, Toma (2023), argued that inquiry-based active learning approaches have been proven to be more effective teaching strategies of teaching and learning chemistry at all levels of education. This covers not only students but evidence indicated that teachers were also trained using inquiry on how to implement PhET simulations to their classroom. For example, while Makamu and Ramnarain (2022) integrate 5E inquiry-based to develop students' understanding of scientific ideas and concepts, Bonny (2022) use 5E inquiry-based to train science teachers how to use PhET interactive simulations.

Siswoyo & Mulyati (2021), conducted a study to identify students' responses of how they analyze the relationship between forces and changes in kinetic energy in objects moving in horizontal field. The authors used inquiry-based exploration where 36 students play an energy skate simulation experiment by placing the objects on the track. The result indicated that students' interpretation of graph is better after using PhET than before. Students were interested in PhET interactive simulation and actively ask questions during the lesson.

Guided inquiry was used by Sebatana & Dudu (2023) to utilise PhET interactive simulations in the teaching and learning of sub-microscopic behaviour of particles in

Three States of Matter (TSM). The finding of the study showed that, despite the advantages of PhET interactive simulations to promote conceptual understanding and allowing for the administration of TSM laboratory experiments, interactive simulations may result in misconceptions. Collaborative inquiry-based was used by Taibu et al. (2021) to explore the gain in students' scientific skills and perceptions of using PhET simulations.

### **c. Predict-Observe-Explain (POE) method**

The effectiveness of the POE model with PhET simulations in enhancing critical thinking skills of senior high school students in Indonesia was investigated by Alfiyanti and Jatmiko (2020) where they found out that the instructional approach with PhET simulations improved students' critical thinking skills and increased the student' level of active learning. This approach was introduced by White and Gunstone (1992), ask students to make predictions about the experiment, make observations, and then explain by comparing their predictions with their observations.

Çetinkaya and Kırılmazkaya (2022) explored POE's effect on students' attitudes toward science by reducing students' misconceptions of the concept of greenhouse effect. The results of the study reveals that students who learned with the POE method supported by PhET simulations had a much better understanding of the greenhouse effect, a positive attitude toward science, and fewer misconceptions.

### **d. Project-Based Learning**

Project-based learning (PBL) is an inquiry-based approach that aims to engage students in challenging, active, and meaningful experiences connected to the world outside the classroom. The strategy is increasingly popular trend in the 21st century. Solving highly complex problems requires that students have both fundamental skills (reading, writing, and math) and 21st century skills (teamwork, problem-solving, research gathering, time management, information synthesizing, utilizing high tech tools). Sebatana & Dudu (2023) used project-based learning to utilise PhET interactive simulations in the teaching and learning of sub-microscopic behaviour of particles in three states of matter (TSM)

### **e. Discovery Learning**

The result of a study conducted by Haryanto et al. (2024), reveals that the PhET interactive simulation when integrated with discovery learning approach exhibits exceptional validity and practicality and yields tangible improvements in students' generic chemistry science skills. The study adopted a development method, known as Research and Development (R&D), to develop and validate educational products called "PhET application- based Discovery Learning module". The model applied is the 4-D Model, which includes the Define, Design, Develop and Disseminate stages. The development of this model was guided according to the stages in the Hannafin and Peck model.

### ***Predominantly learning theories that guide researchers on the integration of PhET interactive simulation in the teaching and learning of chemistry***

The findings of the study reveal that researchers predominantly used Constructivism, cognitive load theory, Ausubel's theory of significant learning, and experiential learning theory as a guide integrating PhET interactive simulations into teaching and learning of chemistry. Understanding of the underlying learning theories behind simulation education help teachers in the development of their classroom instructions. According to Babin et

al. (2019), the learning theories are the foundation of an effective educational experience. Thus, teachers need to be familiar with these theories in order to enhance their instructional skills.

**a. Experiential learning theory**

According to Sebatana & Dudu (2023), effective learning takes place when a learner progresses through a cycle of four stages of experiential learning: (i) having a concrete experience; (ii) reflective observation on that experience; (iii) abstract conceptualisation; and (iv) active experimentation. In their study titled “the utilisation of interactive simulations in the teaching and learning of a grade 10 chemistry topic: a case in the North West province of South Africa” Sebatana & Dudu (2023) argued that concrete experience is achieved when the learner actively experiences an activity such as those contained in PhET simulation. Thus, the PhET simulation is proved to be effective in the construction of experience that triggered reflective observation in learning.

**b. Constructivism**

This theory is based on the idea that people actively construct or make their own knowledge, and that reality is determined by your experiences as a learner. A study conducted by Taibu et al. (2021), to explore the gain in students’ scientific skills and perceptions of using PhET simulations was guided by the constructivism.

**c. Cognitive Load Theory**

Cognitive Load Theory was developed by John Sweller in the late 1980s, who argues that human memory has a limited capacity; therefore, instructional procedures need to avoid overloading it with those activities that don't directly enhance learning. When information is entered into human brains, it carries a cognitive load that exerts a processing burden on the brain to provide meaningful learning outcomes to the information. Thus, classroom teachers need to know how they can reduce cognitive load as there are profound implications for learning outcomes. The best learning occurs when the learning environment is aligned with the human cognitive capacity. To investigate the use of simulations alone, versus the use of simulations incorporated into screen-casts, for the teaching and learning of energy changes at the atomic–molecular level, Vandenplas et al. (2021) used cognitive load theory. Flipped, blended, and online learning strategies were employed by the researchers. The result reveals that the enhanced screencast of the simulator was able to help students better connect this concept to the phenomena of ATP hydrolysis.

**d. Ausubel's theory of significant learning**

According to the theory, a learner needs an established cognitive structure that new concepts can be anchored or subsumed into in order to absorb new concepts from spoken material. If the requisite cognitive structure is not available it can be provided with an advance organizer. Cruz et al. (2022) used Ausubel's theory of significant learning to evaluate the effectiveness of three virtual resources: PhET, Crocodile Chemistry605 and Yenka in learning general chemistry, inorganic chemistry and chemical physics. The findings of the 102 students' quasi-experimental research design demonstrate that the activities conducted encourage students to ask questions about the material covered in class, encourage their involvement in the creation of new activities, but most importantly, they aid in the interpretation of the procedural and conceptual content of the subjects developed in the field of chemistry.



### ***Benefits of integrating PhET interactive simulation in remote learning of chemical concepts***

The benefits of integrating interactive simulations in remote learning of chemical concepts. The results of the study revealed that some of the benefits of integrating PhET interactive simulations in remote learning of chemical concepts include, enhancement of student's interest, connect student's experience, it is easy to use, it enhance students' science process skills, motivate students, improve academic achievement, enhanced students' engagement, improved student conceptual understanding, improve critical thinking ability, enhanced students' academic performance, yield positive development in learning, and it yield positive impact on students' attitudes and perceptions about learning. For example, according to Parthiban & Leo (2024) knowledge is a process not a product and we teach chemistry not to produce little living libraries, but rather to get a students to take part in the process of getting knowledge which will enable them acquire science process skills. The author classified process skills in basic process skills (observing, Inferring, classifying, predicting) and integrated process skills (hypothesizing, interpretation data, experimenting, generalizing, manipulating); and both assists to enhance science as a process and never be a product.

Cruz et al. (2022), evaluate the effectiveness of three virtual resources: PhET, Crocodile Chemistry605 and Yenka. Although, Crocodile Chemistry605 and Yenka are programs that must be previously installed and are in the English language, which for some students made their use difficult, they are virtual laboratories that give the student freedom to carry out experimental activities. Similarly, even though, the result indicated that there is no difference in the academic performance of the students when using the three virtual simulators such as PhET, Crocodile Chemistry605 and Yenka, PhET simulator is more effective due to the exceptional facilities it provided including access to it without an internet connection once downloaded and integrated different languages.

Rahmawati et al. (2022), suggested that PhET Interactive Simulations require improvements or additional features to help students better understand conceptual understanding through analogies of product and reactant molecules' movement in the equilibrium system. PhET simulations have been successful in reaching large numbers of users in the K12 or secondary school, colleges and university levels with over 45 million runs per year and usage in all across the 50 states of United States and the entire world (Salame & Makki, 2021). Thus, according to Rahmawati et al., (2022) the use of PhET Interactive Simulations in chemistry provides students with a learning experience where they can explore concepts directly to gain knowledge and experiment in a relatively short time. It offers students the ability to understand and relate both chemical systems and what is happening at the sub-microscopic level through dynamic visualization.

### **Conclusion**

Chemistry is considered difficult for students to learn because many of its concepts are abstract in nature and require visualisation at the sub-microscopic level of representation. And due to the nature of these abstract chemical concepts, students often experience multiple problems with understanding the lessons taught. The study investigated the most employed instructional strategies used by educators when integrating PhET interactive simulation. It also investigated the most learnt chemical concepts and psychological theories guiding the instruction design by the educators. In order to address these



objectives, the study adopted a systematic review of academic research published after the COVID-19 pandemic (2020-2024). After subjecting the obtained data to inclusion and exclusion criteria, 25 articles qualified for the study. The results indicated that the chemical processes/concepts learnt in the classroom with the aid of PhET interactive simulation include “physical chemistry,” “chemical bonding,” “Three State of Matter (solid, liquid, and gas),” “chemical equilibrium,” “general chemistry,” and “acid-base concept.” It also reveals that the volumetric analysis of acid and base chemistry is the most learnt concept in the laboratory via interactive simulations. The findings also reveal that the predominant instructional strategies used for delivering instruction via PhET interactive simulations include inquiry, problem-based learning, project-based learning, discovery learning, and the Predict-Observe-Explain (POE) method. Finally, constructivism, cognitive load theory, Ausubel's theory of significant learning, and experiential learning theory are predominantly used theories guiding integration of PhET interactive simulation in the teaching and learning of chemistry.

Interactive simulations help learners to repeat experimental simulations several times and subsequently assist in the realisation of scientific phenomena. Simulations help learners grasp real-world data through multiple representations. Simulations give students the opportunity to visualise and experience things that would be impossible to handle in the laboratory, such as manipulating an object. Interactive simulations are the enhancement of motivation and creativity.

### Recommendation

The study recommended that governments across all continents should endeavour to overcome the problem of shortage of equipment and capabilities, fund experiments, and provide security and protection for learners from health, physical, and environmental risks when carrying out experiments. Teachers should assist learners to link the theoretical side and the applied side.

### References

- Aliyu, F., Talib, C. A., & Aliyu, H. (2021). Multi-Dimensional Visualization Support Mechanism and Students' Achievement in Chemical Bonding and Structures. *4th ASEAN International Conference on Education and Social Sciences*, 1–13.
- Aliyu, H., Raman, Y., & Talib, C. A. (2021). Enhancing Cognitive Development in Learning Chemical Symbol and Periodicity through Instructional Game. *International Journal of Asian Education*, 2(3), 285–295. <https://doi.org/10.46966/ijae.v2i3.115>
- Casa-coila, M. D., Mamani-vilca, P. S., Tisnado-mamani, L. M., Pari-achata, D., & Vilca-apaza, H. M. (2023). Model Chemlab and PhET Simulator: A Didactic Resource for Chemistry Learning in Undergraduate Students. *International Journal of Membrane Science and Technology*, 10(5), 59–75. <https://doi.org/10.15379/ijmst.v10i5.2420>
- Cruz, E. P. U., Salcán, N. de J. S., & Riofrío, M. C. O. (2022). Experimental Activities using Virtual Simulators to Learn Chemistry During COVID-19 Pandemic. *SciELO Preprints*, 22(1), 122–137. <https://doi.org/https://doi.org/10.1590/SciELOPreprints.3668>

- Dantic, M. J. P., & Fularon, A. R. (2022). PhET interactive simulation approach in teaching electricity and magnetism among science teacher education students. *Journal of Science and Education (JSE)*, 2(2), 88–98. <https://doi.org/10.56003/jse.v2i2.101>
- Dukes, A. D. (2020). Teaching an Instrumental Analysis Laboratory Course without Instruments during the COVID-19 Pandemic. *Journal of Chemical Education*, 97(9), 2967–2970. <https://doi.org/https://doi.org/10.1021/acs.jchemed.0c00648>
- Efendi, N., & Budi, S. (2021). The Effect of Distance Learning Practicum based on PhET Interactive Simulations on Science Process Skills of Secondary School Students. *Jurnal Pendidikan Sains (JPS)*, 9(1), 91–96. <https://doi.org/https://doi.org/10.26714/jps.9.1.2021.91-96>
- Eichler, J. F. (2022). Future of the Flipped Classroom in Chemistry Education: Recognizing the Value of Independent Preclass Learning and Promoting Deeper Understanding of Chemical Ways of Thinking During In-Person Instruction. *Journal of Chemical Education*, 99(11), 1503–1580. <https://doi.org/https://doi.org/10.1021/acs.jchemed.1c01115>
- Emenike, M. E., Schick, C. P., Van Duzor, A. G., Sabella, M. S., Hendrickson, S. M., & Langdon, L. S. (2020). Leveraging undergraduate learning assistants to engage students during remote instruction: Strategies and lessons learned from four institutions. *Journal of Chemical Education*, 97(9), 2502–2511. <https://doi.org/10.1021/acs.jchemed.0c00779>
- Endrayani, I., Efendi, A., & Yamtinah, S. (2022). Identification of the Need for PhET Simulation-based Interactive Media for Learning in Vocational High Schools. *Journal of Educational Research and Evaluation*, 6(3), 667–677. <https://doi.org/https://doi.org/10.23887/jere.v6i4.53040>
- Faizah, S. N., Dina, L. N. A. B., Kartiko, A., Ma'arif, M. A., & Hasan, M. S. (2024). Student Acceptance Study of PhET Simulation with an Expanded Technology Acceptance Model Approach. *Journal of Applied Engineering and Technological Science (JAETS)*, 5(1), 279–290. <https://doi.org/10.37385/jaets.v5i1.3041>
- Gong, X., Wei, B., Bergey, B. W., & Shockley, E. T. (2023a). Unpacking Chemistry Teachers' Pedagogical Reasoning and Decisions for a PhET Simulation: A TPACK Perspective. *Journal of Chemical Education*, 100(1), 34–44. <https://doi.org/https://doi.10.1021/acs.jchemed.2c00397>
- Gong, X., Wei, B., Bergey, B. W., & Shockley, E. T. (2023b). Unpacking Chemistry Teachers' Pedagogical Reasoning and Decisions for a PhET Simulation: A TPACK Perspective. *Journal of Chemical Education*, 100(1), 34–44. <https://doi.org/hpps://doi.10.1021/acs.jchemed.2c00397>
- Gunawan, A., Heliawati, L., & Permanasari, A. (2023). Effectiveness of Deep PhET Interactive Simulation Improving Understanding of the Concept of Material Change. *Journal of Science Education and Practice (JSEP)*, 7(2), 92–102. <https://doi.org/https://journal.unpak.ac.id/index.php/jsep>

- Haryanto, Asrial, Sanova, A., Widowati, A., & Saputra, A. (2024). Generic Science Skills: PhET Applications Based On Discovery Learning. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 8(1), 158–169. <https://doi.org/10.22437/jiituj.v8i1.32441>
- Juwairiah, Riana, M., & Windiani. (2022). Digitization of laboratory equipment using PhET simulation media in applied chemistry practicum. *International Journal of Trends in Mathematics Education Research*, 5(2), 169–173. <https://doi.org/https://doi.org/10.33122/ijtmr.v5i2.131>
- Komang, I. G., Angga, A., Widiarta, P., Wahyu, I. G., Antara, S., & Dewantara, A. K. (2023). Problem Based Learning Model Assisted by PhET Interactive Simulation Improves Critical Thinking Skills of Elementary School Students. *Thinking Skills and Creativity Journal*, 6(1), 1–8.
- Lahlali, A., Chafiq, N., Radid, M., Moundy, K., & Srour, C. (2023). The Effect of Integrating Interactive Simulations on the Development of Students' Motivation, Engagement, Interaction and School Results. *International Journal of Emerging Technologies in Learning (IJET)*, 18(12), 193–207. <https://doi.org/10.3991/ijet.v18i12.39755>
- Mojica, E. E., & Upmacis, R. K. (2022). Challenges Encountered and Students' Reactions to Practices Utilized in a General Chemistry Laboratory Course During the COVID-19 Pandemic. *Journal of Chemical Education*. <https://doi.org/10.1021/acs.jchemed.1c00838>
- Nizar, M., Najib, M., Md-ali, R., & Yaacob, A. (2022). Effects of Phet Interactive Simulation Activities on Secondary School Students' Physics Achievement. *South Asian Journal of Social Sciences & Humanities*, 3(2), 73–88. <https://doi.org/https://10.48165/sajssh.2022.3204>
- Ouahi, M. Ben, Hou, M. A., Hassouni, T., & Al Ibrahim, E. M. (2021). Opinions of Moroccan teachers towards the use of PhET simulations in teaching and learning physics – chemistry. *IEEE Xplore*, 274–278. <https://doi.org/10.1109/CiSt49399.2021.9357174>
- Ouahi, M. Ben, Lamri, D., Hassouni, T., & Al-Ibrahmi, E. M. (2022). Science Teachers' Views on the Use and Effectiveness of Interactive Simulations in Science Teaching and Learning. *International Journal of Instruction*, 15(1), 277–292. <https://doi.org/https://doi.org/10.29333/iji.2022.15116a>
- Parthiban, J., & Leo, S. S. (2024). Enhancing the Science Process Skills through Phet Simulation. *International Research Journal on Advanced Engineering and Management*, 2(3), 432–435. <https://doi.org/https://doi.org/10.47392/IRJAEM.2024.0060>
- Patricia, E., & Cruz, U. (2022). Experimental Activities Using Virtual Simulators to Learn Chemistry During Covid-19 Pandemic. *CHAKIÑAN. Revista de Ciencias Sociales y Humanidades*, 122–137. <https://doi.org/https://doi.org/10.37135/chk.002.17.08>

- Peperkorn, Y., Buschmann, J., & Schwedler, S. (2024). Comparing drawing tasks and elaborate single-choice questions in simulation-based learning: How do they facilitate students' conceptual understanding on chemical equilibria? *Chemistry Education Research and Practice*. <https://doi.org/10.1039/D3RP00113J>
- Rahayu, C. D., & Sartika, S. B. (2020). Students Learning Motivation and Concepts Understanding of Science through the Use of PhET Interactive Simulations Motivasi Belajar dan Pemahaman Konsep IPA. *Science Education Journal (SEJ)*, 4(1), 63–76. <https://doi.org/10.21070/sej.v4i1.750>
- Rahmawati, Y., Hartanto, O., Falani, I., & Iriyadi, D. (2022). Students' Conceptual Understanding in Chemistry Learning using PhET Interactive Simulations. *Journal of Technology and Science Education*, 12(2), 303–326. <https://doi.org/https://doi.org/10.3926/jotse.1597>
- Rayan, B., Daher, W., Diab, H., & Issa, N. (2023). Integrating PhET Simulations into Elementary Science Education: A Qualitative Analysis. *Edu. Sci.*, 13(884), 1–17. <https://doi.org/https://doi.org/10.3390/educsci13090884>
- Rehman, N., Mahmood, A., Zhang, W., & Alam, F. (2021). Teaching Physics with Interactive Computer Simulation at Secondary Level. *Brazilian Journal of Education, Technology and Society (BRAJETS)*, 14(1), 127–141. <https://doi.org/http://dx.doi.org/10.14571/brajets.v14.n1>
- Salame, I. I., & Makki, J. (2021). Examining the Use of PhET Simulations on Students' Attitudes and Learning in General Chemistry II. *Interdisciplinary Journal of Environmental and Science Education*, 17(4), 1–9. <https://doi.org/https://doi.org/10.21601/ijese/10966>
- Sebatana, M. J., & Dudu, W. T. (2023). The Utilisation of Interactive Simulations in the Teaching and Learning of a Grade 10 Chemistry Topic: A Case in the North West province of South Africa. *14th International Conference on Education Technology and Computers (ICETC 2022)*, 182–188. <https://doi.org/https://doi.org/10.1145/3572549.3572579>
- Siswoyo, S., & Mulyati, D. (2021). Teaching high school physics using PhET interactive simulation. *The 2nd Science and Mathematics International Conference (SMIC 2020)*, 030003(April), 030003-1–7. <https://doi.org/https://doi.org/10.1063/5.0041657>
- Taibu, R., Mataka, L., & Shekoyan, V. (2021). Using PhET simulations to improve scientific skills and attitudes of community college students. *International Journal of Education in Mathematics, Science, and Technology (IJEMST)*, 9(3), 353–370. <https://doi.org/https://doi.org/10.46328/ijemst.1214>
- Talib, C. A., Ali, M., Zawadzki, R., Baharuddin, N. S., Thoe, N. K., & Aliyu, H. (2017). Video-Based Learning in Chemistry Education: Exemplars, Issues and Challenges. *Learning Science and Mathematics Journal*, 12, 35–51. [http://www.recsam.edu.my/lsm/2017/\(4\)CAT\\_p35-51\\_final.pdf](http://www.recsam.edu.my/lsm/2017/(4)CAT_p35-51_final.pdf)
- Talib, C. A., Aliyu, H., Ali, M., Malik, A. M. A., & Siang, K. H. (2018). Is Sakai Online

Visual Learning Suitable for Cultivating Thinking Skills in Malaysia's Higher Education? *Learning Science and Mathematics Journal*, 33, 87–97.

- Talib, C. A., Aliyu, H., Malik, A. M. A., Siang, K. H., & Ali, M. (2018). Interactive Courseware as an effective strategy to overcome misconceptions in Acid-base Chemistry. *2018 IEEE 10th International Conference on Engineering Education (ICEED)*, 240–245.
- Toma, M. J. (2023). *The Pedagogical Opportunities of PhET Interactive Simulations in Secondary Science Education in Bangladesh*. University of British Columbia.
- Tran, K., Beshir, A., & Vaze, A. (2020). A Tale of Two Lab Courses: An Account and Reflection on the Teaching Challenges Experienced by Organic and Analytical Chemistry Laboratories During the COVID-19 Period. *Journal of Chemical Education*. <https://doi.org/https://dx.doi.org/10.1021/acs.jchemed.0c00649>
- Ulhaq, D., Hanum, L., & Habibatia. (2023). The Effect of Using PhET Simulations Virtual Lab on the Understanding of the Acid-Base Concept (A Case Study at Chemistry Education Department, Syiah Kuala University). *Chimica Didactica Acta*, 11(1), 8–14. <https://doi.org/https://doi:10.24815/jcd.v11i1.28257>
- Vandenplas, J. R., Herrington, D. G., Shrode, A. D., & Sweeder, R. D. (2021). Use of Simulations and Screencasts to Increase Student Understanding of Energy Concepts in Bonding. *Journal of Chemical Education*, 98(3), 730–744. <https://doi.org/10.1021/acs.jchemed.0c00470>
- Yaman, F., & Hand, B. (2024). Exploring Conditions for Utilizing Representations in Chemistry in an Argument-Based Inquiry Environment: Laboratory Only, Technology Only, or a Combination of Laboratory and Technology. *Journal of Chemical Education*. <https://doi.org/https://doi.org/10.1021/acs.jchemed.3c01136>
- Yassin, A. A. B. (2022). The Effect of Using Interactive Simulation (PhET) and Virtual Laboratories (Praxilabs) on Tenth- Grade Students' Achievement in Physics. *Britain International of Linguistics, Arts and Education (BIoLAE) Journal*, 4(2), 58–72. <https://doi.org/https://doi.org/10.33258/biolae.v4i2.693-58->
- Yulianti, E., Zhafirah, N. N., & Hidayat, N. (2021). Exploring Guided Inquiry Learning with PhET Simulation to Train Junior High School Students Think Critically. *Berkala Ilmiah Pendidikan Fisika*, 9(1), 96–104. <https://doi.org/10.20527/bipf.v9i1.9617>



## **EFFECT OF DRUGS ABUSED ON ACADEMICS ACHIEVEMENT AMONG SENIOR SECONDARY SCHOOL STUDENTS IN YAURI LOCAL GOVERNMENT AREA, KEBBI STATE: IMPLICATION FOR COUNSELLING**

**<sup>1\*</sup>Mukhtar Nawait Salihu & <sup>2</sup>Aliyu Papa Khalied**

<sup>1&2</sup>Department of Educational Foundations,  
Faculty of Education,  
Sokoto State University, Sokoto  
Email: [muknawait@gmail.com](mailto:muknawait@gmail.com)

---

### **Abstract**

*The study investigated on drugs abuse and its effect on academic achievement among senior secondary school students of Yauri local government area, Kebbi State. Implication for counselling. It employed descriptive survey design and population of study consist of students in all senior secondary schools in the study area. And the sample size of 160 teachers and 364 students from population of 270 teachers and 7000 students respectively were used on the bases of sample's table research Advisor, 2006. Two research questions were formulated as guide during the study. Self-developed questionnaire titled; Drug abuse and Academics Achievement "(DAA) with 0.72 and 0.77 validity and test retest reliability respectively. Data were collected and analyzed using frequencies and percentages and the results obtained that, technological exposure and peer group influences were the main contributing factors to drug abuse among secondary students in the study area. It was also gathered that drug abuse result to mental health problems of students and poor concentration which result low academic achievement. Based on the findings it was recommended that, Parent should monitor, supervise and possibly limit their children level of exposure to social media technology and peer group relationship. Guardians Counsellor and governments should consider issue of drug as matter that requires serious and urgent attention to save millions of Nigerian from running mad due to several mental disorders.*

**Keywords:** Drug Abuse, Students' academic Achievement, Counselling, Secondary School

### **Introduction**

Drug abuse amongst the global youth population has become a serious problem affecting everyone. Addiction leads many people, young people prominent amongst them, into downward spiral of hopelessness that in some cases ends fatal. They range from glue-sniffing street children and teenage ecstasy users, to hard core heroin and cocaine addicts (Nacada, 2005). Drug abuse is responsible for lost wages, destruction of property in schools, soaring health care costs and broken families. It is a problem which affects us all as parents, children, teachers, government officials, taxpayers and workers.

Drug abuse may be defined as the "arbitrary" over dependence or miss-use of one particular drug with or without a prior medical diagnosis from qualified health practitioner. Drug abuse is the harmful use of substances that may eventually alter or change individual ways of thinking (Masibo, 2013). It added that the term usually refers



to problems with illegal drugs, which also include harmful use of legal prescription drugs, such as in self-medication. Majority of the Nigerian adolescents ignorantly depend on one form of drug or the other for their various daily activities-social, educational, political moral etc. such drugs include: Tobacco, Indian hemp, Cocaine, morphine, heroine, alcohol, ephedrine, madras, caffeine, glue, barbiturates and amphetamines. Oshodi, Aina, Onajole, (2010) in their studies on perception of drug abuse amongst Nigerian undergraduate identified dependence and addiction as one of the major consequence of drug abuse, characterized by compulsive drug craving seeking behaviors are used that persist even in the face of negative consequence. These changes are maladaptive and inappropriate to social or environmental setting, therefore may place the individual at risk of harm. Drug use among youth's and adolescents should be a matter of concern to all Nigerians especially the socially, government, school heads, religious leaders, groups and other NGOs.

The following seven factors are the leading causes of drug abuse in young one. Taylor,(2003).

### ***1. Depression and Mental Illnesses***

Depression in adolescent girls is not uncommon. Over one-third of high school girls reports regular feelings of sadness or hopelessness.. Young women who are depressed and suicidal often self-medicate with drugs of abuse, increasing their risk of drug addiction.

### ***2. History of Trauma***

Among all adolescents in drug treatment, nearly twice as many girls as boys report sexual or physical abuse in their lifetime. Girls who have been physically or sexually abused are also more likely to smoke, drink, and use drugs than those who were not abused in childhood.

### ***3. Stress and Inability to Cope***

While males tend to externalize their stress with aggression and delinquency, females have a tendency to internalize their reactions to stress. In most cases of severe stress, young women become depressed and withdrawn. According to the survey, 41 percent of young women report their inability to cope with stress as the main reason for using drugs. Stressful life events may include a death or illness in family or friends, parental divorce, changes in school or relationships, and moving from home to home.

### ***4. Low Self-Esteem***

Low self-confidence frequently accompanies the teenage years. This is especially true among girls. Body-image and social image are often top priorities for high school girls who want to fit in. They associate weight loss with beauty and popularity. They associate drinking, drug use, and smoking with being sexy, trendy, and cool. They believe that drugs are the answer to their problems.

Teenage girls with low self-confidence are twice as likely as those with higher self-confidence to report drug use. Not only are high school girls more than double as likely to diet and engage in unhealthy weight-related behaviors than boys, but they are also more likely to use drugs or alcohol to try to control their weight.

### **5. Social Pressures**

One study found that many teenage girls initiate drug use to fit in with their peers. Another study of 11 to 13-year old girls revealed that the most “popular” girls believe they are under even more pressure to smoke, drink, and try drugs. According to the report, the more friends a girl has who smoke, drink, or use drugs; the likelier she is to do so herself. If five of her close friends drink alcohol, she is over seven times likelier to drink.

### **6. Academic Pressures**

High school is undoubtedly a time of great academic pressure for young women. It is the time that matters most for colleges, and the time in which students come to a new, mature level of learning. Yet academics and substance abuse can easily (and dangerously) intertwine. Teens who get A’s and B’s in school are at half the risk of drug use as teens that have poor school performance.

### **7. Lack of Parent-Child Communication**

One of the greatest things a parent can do to prevent their daughter’s drug use is simply to communicate. If you believe your teenager is at risk of using drugs, talk to her about the consequences of drug abuse and her options. Teach her how to say no. Educate her about the risks of substance abuse.

### **8. Peer Group**

This is one of the common causes of drug addiction and abuse. It is a form of societal influence on the affected youth. “Peer group is a group of people of the same age or social status” (Hornby, 2012). Peer groups cause a lot of evil like drug abuse, armed robbery, rape, among our youths in Nigeria and beyond. Someone can be influenced to become a drug addict by his friends who are drug addicts. Some people are drug addicts today because they associate with drug addicts and they do not want to be called “Jew guys” by their friends. Some people are compelled by their friends to become drug addict.

## **Effect of Drug abuse**

Drugs are chemicals that affect the body and brain. Different drugs can have different effects. Some effects of drugs include health consequences that are long & short lasting and permanent. They can even continue after a person has stopped taking the substance. The effects of the drug in the body depend on how the drug is delivered. For example, the injection of drugs directly into the bloodstream has an immediate impact, while ingestion has a delayed effect. But all misused drugs affect the brain. They cause large amounts of dopamine, a neurotransmitter that helps regulate our emotions motivation and feelings of pleasure, to flood the brain and produce a “high”. Eventually, drugs can change how the brain works and interfere with a person’s ability to make choices, leading to intense cravings and compulsive drug use. Over time, this behavior can turn into a substance dependency, or drug addict.

Long term effects include; insomnia and exhaustion, nasal problems, anxiety, eating disorder, weight loss, sexual dysfunction (not performing well), heart damage lungs problems, kidney failure, problems with memory learning, decreased motivation and concentration, psychosis (United Nations Office on Drugs and Crime, 2017).

Drug abuse has short term effects which include; loss of inhibition (can feel usually well, happy, talkative), quiet and reflective mood, drowsy (tired), intense or altered senses to sound, colour and other sensations, altered memory and thinking, confusion, anxiety (worry, nervous, tense) and mild paranoia (feeling undue suspicion of others) altered vision and bloodshot eyes, dryness of the eyes, mouth and throat, reduced coordination and balance, decreased nausea (United Nations Office on Drugs and Crime, 2017). It also affect academic performance, for instance Gazette, (2015) which found the drug use to be a perpetual problem for the school going adolescent because it undermines academic ability of a student and performance.

High school is undoubtedly a time of great academic pressure for young women. It is the time that matters most for colleges, and the time in which students come to a new, mature level of learning. Yet academics and substance abuse can easily (and dangerously) intertwine. Teens who get A's and B's in school are at half the risk of drug use as teens that have poor school performance and academic achievement.

According to (United Nations Drug Control Programme, 2002) marijuana consumption was said to be widely spread in Africa. It was said that beyond 25 million of consumers constituted 5.8% of the adult population whereby the world average was 3.4% of the adult population. In African continent it was said that 61% of people who got treated for drug abuse were often displayed with the serious psychological disorders and mostly were cannabis users and 2/3 of them were youth.

In the year 2001 it was reported that in Africa the situation reached at a very serious point that African countries represented at the International Narcotics Convention held in Vienna in late March 2001 just asked the UN to put an exceptional effort in the battle against the vice on behalf in the regions (International Narcotics Control Board, 2001). According to Agbonghalel and Okaka(2014) who investigated the effects of drug abuse on academic performance on technology education students in Nigerian public universities found that 82.79% of the population who participated in study agreed that hard drugs had some effects on academic performance of technology education students in Nigerian public universities who involved in drug abuse. According to Otieno, (2012) who conducted a study on environmental and demographic factors influencing drug and substance abuse among secondary school students in Kisumu town east in Kenya, indicated some statistical information from Kisumu District Hospital to have an increase in mental and behavioral disorders due multiple drug consumption and the use of other psychoactive substances (Kisumu District Hospital Office, 2012). In 2010, those between the age of 15-24 years who were admitted in the very hospital with mental and behavioural disorders due to drug abuse were about three, among them one patient died from psychotic disorders. Meanwhile in year 2011, there were psychiatric cases related to multiple drug use and other psychoactive substances within secondary school age (15-24) years which increased to ten so this percentage increase was almost 33%. As the results deaths that arose from drug and other substances abuse continued to increase one year after another in Kisumu town (Kisumu District Hospital, 2012).

Similarly Tuwei, (2014) in his study on influence of drug abuse on students' academic performance in public universities showed that alcohol abuse influences on academic performance such as heavy drinking which has got a negative effect. Marijuana abuse was said also to directly impair academic abilities that limit academic performance and the minority of students who were daily marijuana dealt with highly segregated ways of

behavior were noted to involve in criminal behaviors such as breaking laws or when individuals involved in criminal acted to fund their drug abusers (Tuwei, 2014).

Furthermore, findings showed that tobacco uses lead to lack of studies' concentration, sleepless, lack of appetite, dodging classes, physical weakness, and rejection from the friends. At the same time school administrators who were interviewed also provide the effects of drug abuse such as; Irresponsible citizens, theft, school dropout high rate, poor in academic achievement, indiscipline, poor health, and individual negligence. These aspects are slowly said to lead to drop out, expulsion from school and poor academic performance. On top of that, barbiturate users were adversely affected in terms of mental health (Tuwei, 2014). In his results, abuse of barbiturates stood at 24% in colleges. These drugs tended to make the user moody, anxious and impulsive according to his findings. Also the researcher discovered that low academic performance was caused mostly by anxiety and restlessness. But also the use of these drugs wasted academic time since students had to visit hospitals frequently and for longer time therefore leading in a drop in academic performance (Tuwei, 2014).

Tuwei, (2014) showed that the best students did well academically, the less were likely to smoke. In addition that a poor grade early in life is believed to predict strong increased tobacco consumption at later date and sometimes can be difficulties in quitting smoking. Meanwhile (Bryant, 2000) as cited in (Tuwei, 2014) did a test on the relationship between school achievements and smoking whereby they came up with arguments that smoking might lead indirectly to poor school achievement.

### **Research Questions**

- I. What are the causes of drug abuse among Senior Secondary School Students in Yauri Local Government of Kebbi State?
- II. What are the effect of drug abuse on student's academic performance among Senior Secondary School Students in Yauri Local Government of Kebbi State?

### **Methodology**

Descriptive survey deign was utilized, during which questionnaire was used in soliciting information from the respondents. The populations of the study consist of teachers and students in the 13 secondary school in Yauri Local Government. Purposive sampling technique was used in choosing the schools and the sample size of 160 teachers and 364 students from 270 teachers and 7000 students respectively on the bases of sample's table research Advisor, 2006. Researcher developed questionnaire titled; Drug abuse and its effects "(Dae) with 0.72 and 0.77 validity and test retest reliability respectively. Finally, collected data were analysis using descriptive statistics of frequencies and percentages and results were presented in form tables in chapter four.

## Results

**Research Question One:** What are the causes of drug abuse among Senior Secondary School Students in Yauri Local Government of Kebbi State?

**Table 1:** Result of Responses as regards to why Students Engage in Drug Abuse

S/N	Items	SA(%)	A(%)	D(%)	SD(%)
1	Teacher having favourite students cause drug abuse	46(13)	42(12)	106(29)	170(46)
2	Technology and peer group contribute to drug abuse	131(36)	140(38)	51(14)	42(12)
3	Bad attitude among teachers contribute to drug abuse	106(29)	115(32)	78(21)	65(18)

The above table 1 indicated that, 146 of the respondents representing 13% and 42 of the respondents representing 12% strongly agreed and agreed that teacher having favourite students was cause of drug abuse while 106 of the respondents representing 29% and 107 of the respondents representing 46% disagreed and strongly disagreed teacher having favourite students was not the cause of drug abuse among the students. Also 131 of the respondents representing 36% and 140 of the respondents representing 38% strongly agreed and agreed that, technology and peer group were factors contribute to drug abuse among students while 51 of the respondents representing 14% and 42 of the respondents were of view that technology and peer group influence does not contribute to drug abuse. Similarly, 106 of the respondents representing 29% strongly agreed that bad attitude among teachers contribute to drug abuse 115 of the respondents representing 32% were also established that bad attitude among teachers contribute to drug abuse while 78 of the respondents representing 21% and 65 of the respondents representing 18% had contrary opinion that bad attitude among teachers does not contribute to drug abuse.

**Table 2:** Responses as regards to Effect of Drug Abuse on Student’s Performance

S/N	Items	SA(%)	A(%)	D(%)	SD(%)
1	Drug abuse make students fail exams	107(29)	82(22)	94(23)	81(22)
2	Drug abuse among student result to school drop-out	74(20)	88(24)	106(29)	98(27)
3	Drug abuse result to mental problems to students	106(29)	115(32)	78(21)	65(18)

The result of table 2 above indicated that 107 of the respondents representing 29% strongly agreed that drug abuse make students fail exams and 82 of the respondents representing 22% also agreed that drug abuse make students fail exams while 94 of the respondents representing 23% and 81 of the respondents representing 22% disagreed and strongly disagreed that Drug abuse does not make students fail exams. Also 74 of the respondents representing 20% and 88 of the respondents representing 24% strongly and agreed drug abuse among student result to school drop-out while 106 of the respondents



representing 29% and 98 of the respondents representing 27% disagreed and strongly disagreed that drug abuse among student does not result to school drop-out. Furthermore, 106 of the respondent respondents representing 29% and 115 of the respondents representing 32% strongly agreed and agreed that drug abuse result to mental problems to students while 78 of the respondents representing 21% disagreed and 65 of the respondents representing 18% strongly disagreed that drug abuse does not result to mental problems to students.

## **Discussion**

The findings of the study are discussed in line of the research questions answered. As regards to question one which stated that; what are the causes of drug abuse among Senior Secondary School Students in Yauri Local Government of Kebbi State? The result revealed that majority of students established technology and peer group influences as major contributors to drug abuse among the students, this finding agreed with Hornby, (2012) ascertained that drug abuse among our youths in Nigeria and beyond are caused by peer groups. Someone can be influenced to become a drug addict by his friends who are drug addicts. Some people are drug addicts today because they associate with drug addicts and they do not want to be called “Jew guys” by their friends. Some people are compelled by their friends to become drug addict. One would like to be identified with his friends or peer group and when one is addicted to a particular drug he or she will have the craving for that drug thereby losing the sense of direction in his or her life. Another cause of drug abuse that was ascertained by the majority of the teachers was lack of parental care/supervision. The finding also corresponded with Haladu (2003) which explain some of the following as causes of drugs abuse among secondary students, Peer Group Influence: Peer pressure plays a major role in influencing many adolescents into drug abuse..

The research question two which was on effect of drug abuse on student’s academic Performance, The data of the findings revealed that, majority of the students strongly believed that drug abuse result to mental problems, when a child continues abuse drug, when it reaches a stage the brain will be affected, also it affect academic performance of student negatively. This finding agreed with Otieno, (2012) who conducted a study on environmental and demographic factors influencing drug and substance abuse among secondary school students in Kisumu town east in Kenya, indicated some statistical information from Kisumu District Hospital to have an increase in mental and behavioral disorders due multiple drug consumption and the use of other psychoactive substances. It also agreed with Kisumu District Hospital Office, (2012) which ascertained in 2010 that those between the age of 15-24 years who were admitted in the every hospital with mental and behavioural disorders due to drug abuse were about three, among them one patient died from psychotic disorders. Majority of the teachers also indicated that inabilities to concentrate was also another effect of drug abuse. The result also agreed with Gazette, (2015) which found the drug use to be a perpetual problem for the school going adolescent because it undermines academic ability of a student and performance.

## ***Implication for Counselling***

Personal social guidance and counselling service is highly needed in schools particularly among adolescence which form the arms of senior secondary school students. This life stage is delicate and crucial as it is dominated by Id libido personality. The students can



easily be influenced by environmental forces like peer group for immediate gratification of their faulty desires. Therefore, individual and group counselling should be made available in the schools through the activities of School Counsellor to help such students adjust to normal and acceptable lifestyle expected of him by the society. National Drug Law Enforcement Agency (NDLEA) need to be invited by school counsellor and Principal occasionally to deliver lectures, films and symposium to create more awareness among students on causes and consequences of drug's misuses. Those caught should be referred to counsellor by school management and parent for counselling therapy.

### **Conclusion**

Based on the findings of the research, technological exposure and peer group influences were the main contributing factors to drug abuse among students in the study area. It was also gathered that drug abuse result to mental health problems of students and poor concentration which result to low academic achievement.

### **Recommendations**

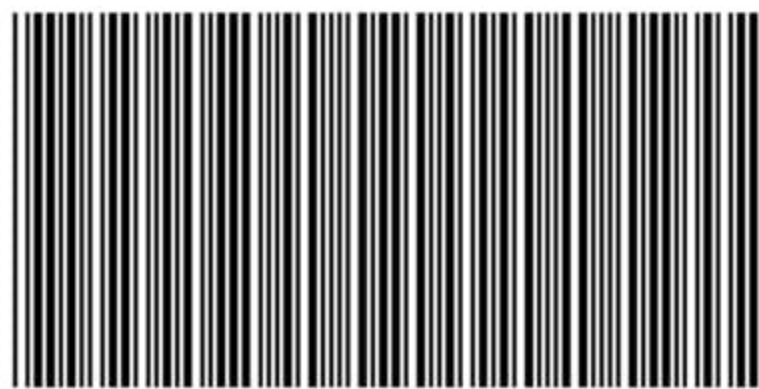
Based on the findings and the conclusion drawn, it was recommended that;

- I. Parent should monitor, supervise and possibly limit their children level of exposure and peer group going about with for healthy interpersonal relationship.
- II. Guardians and governments should consider issue of drug as serious matter that requires urgent attention to save millions of Nigerian from running mad due to drug related mental disorders.

### **References**

- Gazette, A. (2015) Drug use among adolescents in Ilorin, Nigeria. *Tropical Doctor*, 35, 225- 226.
- Haladu, Y. (2003) "The Relation between Alcohol Use or Dependence and Academic Performance in First-Year College Students." *Journal of Adolescent Health*, 31(3), 223-
- Hornby, A. O. (2012). Psychoactive substance use among medical students in a Nigerian university. *World Psychiatry*, 6(2), 48-50.
- International Narcotics Control Board (2001). Drug use in Asia. [www.encyclopaediaofdrugs/education in Kenya](http://www.encyclopaediaofdrugs/education%20in%20Kenya). Accessed 4/5/2005.
- Kisumu District Hospital Office (2012). Influence of Drug Abuse on Students Academic Performance in Public Universities. A case of Uasin Gishu County in Kenya.
- Krejcie A.V & Morgan D.W (1970) Determining Sample Size for research activities. Education and Psychological Measurement.

- Masibo, A. (2013). An assessment of knowledge, attitudes and practices of psychoactive substance use among secondary school students in Dodoma Municipality, Tanzania.
- NACADA, (2011). Central and Western Region have the highest number of Alcohol Abusers. Nairobi: Kenya. NACADA Publishers.
- National Drug Law Enforcement Agency (2015). Drug data collection and research, Lagos: *Drug Demand Reduction Unit*.
- Oshodi H., Aina T.K, and Onajole J.K, (2010). Drug Addiction among Police Secondary School Students. Paper Presented at the Bi-annual conference of the force education officers and the first Nigerian training course for NGO's in the treatment of Drug Dependent Persons in Benin City, Nigeria, 1 – 20
- Tuwei, B. (2014), Personal and Community Health. New York: Oxford University Press.
- Taylor, S. E., (2003) Health Psychology (5th Ed.) Indian: McGraw Hill.
- UNDCP, (2012). World Drug Report. Geneva. United Nations Publications
- UNODC, (2012). Comparative Study on Consumption in 6 Countries in South America. Wwww.un.org. Accessed 20/7/2012.
- United Nations Office on Drugs and Crime (UNODC) Executive Summary, United Nations Publication.



ISSN: 2756 - 6749