INTERNATIONAL JOURNAL OF CONTEMPORARY ISSUES IN INTEGRATED SCIENCE EDUCATION (IJCIISE)

ISSN: 3043-6397

IJCIISE

IJCIISE, Vol. 1, No. 1, 2025

CALL FOR PAPERS
INTERNATIONAL JOURNAL OF CONTEMPORARY ISSUES IN INTEGRATED SCIENCE EDUCATION (IJCIISE)

NOTE TO CONTRIBUTOR

International Journal of Contemporary Issues in Integrated Science Education (IJCIISE) is an annual publication of Integrated Science Educators' Association of Nigeria (ISEAN). The Journal aims at improving the quality of academic and research manuscripts submitted by scholars and researchers, through peer review process, and disseminate the publications through open access to practitioners, educators, educationists, academia, researchers, curriculum planners and policy makers. The manuscripts can have different approaches which are quantitative as well as qualitative.

IJCIISE is an annual and peer - reviewed Journal.

Manuscript submitted to IJCIISE should:

1. have a strong introduction that clearly states the organizing points of the study, acquaints the readers to what is ahead, and makes a direct link between theory, questions and research design
2. have focused literature review that clearly establishes why the topic/problem warrants discussion
3. be prepared according to the style prescribed by the 6th or 7th edition of publication manual of American Psychological Association.

Guidelines for Paper Submission

* Articles should not be longer than 15 A4 - sized pages using Time New Roman, font size of 12. Longer articles will attract additional publication fee.
* Reference style should conform to the American Psychological Association format (6th or 7th Edition). This should be arranged in alphabetical order according to the surname of the authors.
* Footnotes are not allowed.
* Manuscripts' cover should include the title of the paper, author(s) name(s), institution affiliation, contact and E-mail address (es).
* Abstract should not be more than 250 words.
* Articles can be submitted electronically via e-mail to ijisn.2023@gmail.com
* Publication fee of ₦40,000, is a condition for publication that a manuscript submitted to International Journal of Contemporary Issues in Integrated Science Education (IJCIISE) has not been published and will not be simultaneously submitted or published elsewhere.

  All fees must be paid into Integrated Science Educators' Association of Nigeria (ISEAN) Account.

Bank Name: **Polaris Bank**
Account Name: **Integrated Science Educators'Association of Nigeria**
Account Number: **1140280168**

* Submissions are published at the editor's exclusive discretion. Submission that does not conform to these guidelines may not be considered for publication.

EDITORIAL BOARD

Prof. O. S. Agboola
(Editor - in - Chief)

Prof. C. Nwafor
(Managing Editor)

Editors
Prof. P. O. Jegede
Prof. T. O. Bello
Prof. J. G. Adewale
Prof. A. U. Nwanekezi
Dr. S. O. Olajide

EDITORIAL CONSULTANTS

Prof. A. Akinlua	-	Department of Chemistry, Obafemi Awolowo University, Ile-Ife
Prof. R. W. Gimba	-	Federal University of Technology, Minna, Niger -State
Prof. J. B. Bilesanmi	-	Department of Curriculum Studies and Instruction Technology, Olabisi Onabanjo University, Awoderu Ago-Iwoye
Prof. S. Garba	-	Department of Science and Technology Education, Bayero University, Kano
Prof. T. O. O. Oladipupo	-	Department of Botany, Obafemi Awolowo University, Ile-Ife
Prof. M. O. Yusuf	-	Department of Science and Technology Education, University of Ilorin
Prof. P. O. Ajaja	-	Department of Science Education, Delta State University, Abraka
Prof. M. A. Adeleke	-	Department of Science and Technology Education, Obafemi Awolowo University, Ile-Ife.
Prof. A. N. Ngozi	-	Department of Science Education, Nnamdi Azikwe University, Nnsukka
Prof. O. A. Sofowora	-	Department of Educational Technology and Library Studies, Obafemi Awolowo University, Ile-Ife
Prof. I. A. Olaosun	-	Dept. of English, Obafemi Awolowo University, Ile-Ife
Prof. A. T. Akande	-	Dept. of English, Obafemi Awolowo University, Ile-Ife

Prof. I. Ogunlade	-	Department of Chemical Sciences, School of Physical Sciences, College of Science, Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti
Prof. A. G. Fasanya	-	Department of Science Education, Faculty of Education, Prince Abubakar Audu University, Anyigba, Kogi State
Dr. A. Tella	-	Department of Science and Technology Education, University of Ibadan, Ibadan
Dr. A. A. Adetunji	-	Department of Science and Technology Education, Obafemi Awolowo University, Ile-Ife
Dr. O. O. Bakare	-	Institute of Education, Obafemi Awolowo University, Ile-Ife
Dr. S. A.Ogundare	-	Science Education Department, Federal University of Kashere, Gombe State, Nigeria
Dr. V. O. Animola	-	Department of Integrated Science, Federal College of Education, Iwo, Osun State, Nigeria
Dr. B. V. Olanipekun	-	School of Science, College of Education, Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti, Ekiti State
Dr. A. A. Oyagbile	-	Department of Integrated Science Education, Adeyemi Federal University of Education (AFUED), Ondo.
Dr. E. I. Nnamonu	-	Department of Biology, Federal College of Education, Eha-Amufu, Enugu, Nigeria
Dr. O. O.Ajala	-	Department of Science, Technology and Mathematics Education, University of Ilesa, Osun State Nigeria
Dr. J. G. Arowolo	-	Integrated Science Department, Federal University of Education, Kontagora, Nigeria
Dr. J. B. Adeniyi	-	Integrated Science Department, Federal College of Education, Abeokuta, Ogun State

EDITORIAL

Dear Readers,

We are excited to announce the launch of International Journal of Contemporary Issues in Integrated Science Education (IJCIISE). This Association Integrated Science Educators' Association of Nigeria (ISEAN) play a vital role in promoting scientific advancement, supporting science education, informing science policy, recognizing science excellence and fostering community engagement. The desire to float this journal was borne out of the passion to organize a yearly conference of Integrated Science by the Integrated Science Educators' Association of Nigeria, of which selected scholarly articles will be published after a thorough review. The journal dedicated to advancing knowledge and fostering dialogue within. Our mission is to publish high-quality research, innovative ideas, and critical analyses that contribute to the understanding and development of Integrated Science. At IJCIISE, we believe in the power of interdisciplinary collaboration and inclusivity. We welcome contributions from scholars, practitioners, and thought leaders worldwide, providing a space for diverse perspectives and groundbreaking work. As we embark on this journey, we invite you to submit your research, engage with our content, and join us in creating a vibrant academic community. Together, we can push the boundaries of knowledge and inspire future generations. Thank you for your support as we launch this exciting new endeavour.

This edition moves around issues that border on **"Enhancing Quality Assurance in Integrated Science in Nigeria."** It is believed that diverse contributions from scholars and researchers expressed in this edition will provoke the understanding of issues that could foster education for societal transformations on a global scale
We look forward to your contributions!

For further information on future conference activities, visit **http://ijciise.org/index.php/ijciise**

Warm regards,
Professor O. S. Agboola
President, Integrated Science Educators' Association of Nigeria (ISEAN)

TABLE OF CONTENTS

ASSESSMENT OF THE LEVEL OF STAKEHOLDERS INVOLVEMENT IN THE IMPLEMENTATION OF NATIONAL POLICY IN BASIC SCIENCE IN SOUTHWESTERN, NIGERIA
Busayo Veronica OLANIPEKUN, Ph.D., Simeon Olayinka OLAJIDE, Ph.D. & Abiodun Emmanuel OKEYA, Ph.D. 1-12

STRENGTHENING QUALITY ASSURANCE IN BIOLOGY EDUCATION IN NIGERIA TO PRODUCE GLOBALLY COMPETITIVE GRADUATES FOR THE 21ST CENTURY AND BEYOND
Emmanuel Ikechukwu NNAMONU 13-24

AI-TRANSFORMATIVE TOOLS IN TACKLING CHALLENGES IN TEACHING OF PHYSICS IN TERTIARY INSTITUTIONS
Ezekiel Adedayo ADEOLA & Femi Timothy OSHO 25-39

STRENGTHENING QUALITY ASSURANCE IN CHEMISTRY EDUCATION IN NIGERIA: STRATEGIES FOR IMPROVEMENT
Suleiman Ayodele ADEBAYO, Ph.D. & Victoria Olufunke BABATUNDE, Ph.D. 40-56

ENHANCING QUALITY ASSURANCE IN BASIC TECHNOLOGY THROUGH PROJECT BASED LEARNING AT THE BASIC LEVELS IN NIGERIAN SCHOOLS
Umar Isa MUHAMMAD, Sabo Abubakar BASHIR, Ibn Salihu YAHAYA & Sani Chado MUHAMMAD 57-71

IMPACT OF INQUIRY DEMONSTRATION METHOD IN ENHANCING THE QUALITY OF STUDENTS' PERFORMANCE IN ALGEBRA AMONG SENIOR SECONDARY SCHOOL STUDENTS IN KADUNA STATE, NIGERIA
Ibn Alhassan SULAIMAN, Ph.D. 72-83

INTEGRATED SCIENCE CURRICULUM CONTENTS IN THE CONTEMPORARY NIGERIA: RATIONALIZATION OF ITS INTEGRATION
Jacob Gbemiga AROWOLO, Ph.D, Amina ISYAKU, Joshua OLALERE, Ph.D., Peter AGBENYEKU, Augusta Ndidi OJOKO, & Ganiyu Oladimeji OLARONGBE 84-95

EFFECT OF INQUIRY INSTRUCTIONAL STRATEGY ON PRE-SERVICE TEACHERS' KNOWLEDGE ON GENETICS IN FEDERAL COLLEGE OF EDUCATION, IWO, OSUN STATE
Olarewaju Rasheed RAHEEM, Sekinat Adekilekun FOLORUNSO & Abolore Nimota ABDULKAREEM 96-108

A STUDY OF PERCEIVED DIFFICULT TOPICS IN BASIC SCIENCE CURRICULUM FOR JUNIOR SECONDARY SCHOOL STUDENTS IN IFE CENTRAL LOCAL GOVERNMENT, OSUN STATE
Odunayo Victor ANIMOLA, Ph.D., Omowunmi Sola AGBOOLA, Ph.D. & Bamidele Adegbola ALABI 109-121

ASSESSMENT OF AWARENESS OF ARTIFICIAL INTELLIGENCE IN COLLEGES OF EDUCATION AND ITS EFFECT ON ACADEMIC ACHIEVEMENT OF BIOLOGY STUDENTS
Ajibola Abidemi ADENIJI, Ph.D., Abosede Olajumoke OLABANJI, Elizabeth Odunayo ADEBORI, Justina ACHI & Toluwalope Damilola ADEDIRAN 122-131

QUALITY ASSURANCE IN EARLY CARE EDUCATION IN ONDO STATE
Bowale Elizabeth BABAJIDE, Comfort Aderemi OGUNDIPE & Olufunke Elizabeth AFONJA 132-152

DEMOGRAPHIC VARIABLES AND DIGITAL LITERACY OF MATHEMATICS STUDENTS IN SENIOR SECONDARY SCHOOLS IN OSUN STATE, NIGERIA
Rachel Oluwatoyin ADEBISI 153-162

TEACHERS' FEEDBACK AND SENIOR SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN MATHEMATICS
Oladayo John ADUROTA & Simeon Olayinka OLAJIDE, Ph.D. 163-171

PERCEIVED STRATEGIES FOR ENHANCING QUALITY ASSURANCE ON SECONDARY SCHOOL PHYSICS TEACHERS IN KOGI EAST EDUCATIONAL ZONE
Ayodele Gabriel FASANYA, Ph.D. 172-182

MIND-MAPPING AND JIG-SAW INSTRUCTIONAL STRATEGIES AS PANACEA TO IMPROVING SENIOR SECONDARY SCHOOL STUDENTS' PERFORMANCE AND SKILL ACQUISITION IN AGRICULTURAL SCIENCE IN OSUN STATE, NIGERIA
Waheed Oladele EWUOLA, Ph.D. & Akeem Adedeji ADETUNJI, Ph.D. 183-203

ASSESSMENT OF CLASSROOM SIZE IN THE TEACHING OF MATHEMATICS IN SELECTED SECONDARY SCHOOLS IN AKURE NORTH LOCAL GOVERNMENT AREA, ONDO STATE
Kehinde Oluwaseun AKEREYENI, Fatai Oluseyinde AJAYI & Badirat Aduke JIMOH 204-218

EFFECTIVENESS OF FLOW-MAP AND JIGSAW INSTRUCTIONAL STRATEGIES ON JUNIOR SECONDARY SCHOOL STUDENTS' LEARNING OUTCOMES IN BASIC SCIENCE AND TECHNOLOGY IN ILE-IFE, OSUN STATE
Olakunle Olusegun AWOYALE & Simeon Olayinka OLAJIDE, Ph.D. 219-230

CONCEPTION OF TEACHERS' STRATEGIES ON QUALITY ASSURANCE IN THE DELIVERY OF ACADEMIC CONTENT AMONG BASIC SCIENCE TEACHERS IN IBADAN METROPOLIS, OYO STATE
Veronica Oluwatoyin ANIMASAHUN, Ph.D., Saudat Titilope ADEYANJU & Ganiyat Omolara DAUD 231-242

CLASSROOM INTERACTION AND STUDENTS ACADEMIC PERFORMANCE IN BASIC SCIENCE IN JUNIOR SECONDARY SCHOOLS IN ONDO STATE
Festus Oluwatobi AJALA & Theodora Olufunke BELLO, Ph.D. 243-253

SIGNIFICANCE, IMPLEMENTATION AND CHALLENGES OF IN-SERVICE INTEGRATED SCIENCE TEACHERS' PROGRAMME IN TERTIARY INSTITUTIONS IN NORTHEAST, NIGERIA
Samuel Akinola OGUNDARE, Ph.D. & Ahmed IBRAHIM, Ph.D. 254-267

INVESTIGATION OF AVAILABILITY AND USABILITY OF LABORATORY RESOURCES IN THE TEACHING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN LAGOS STATE
Aminat Adenike OLAYIWOLA, Adebusola Oluseyi MOKANJUOLA & Toluwalope Damilola ADEDIRAN 268-282

EFFECT OF MULTI-MEDIA TEACHING STRATEGY ON STUDENTS' PERFORMANCE IN SECONDARY SCHOOL BIOLOGY IN DEKINA LOCAL GOVERNMENT AREA OF KOGI STATE
Simon Adekali NEGEDU, Stephen Francis IDACHABA, Bunmi Mercy ALAFIYATAYO & Oziehisa DAUDA NANA 283-293

EFFECT OF FLIPPED CLASSROOM INSTRUCTIONAL STRATEGY ON SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT AND RETENTION IN CHEMISTRY IN OSUN STATE, NIGERIA.
Olufunmiso Olatunbosun AJALA, Ph.D. 294-303

TEACHERS' STRATEGIES AND SCIENTIFIC INQUIRY SKILLS OF PRIMARY SCHOOL PUPILS IN OSUN STATE
Hannah Olubunmi AJAYI, Ph.D., Temilola Janet POPOOLA, Ph.D. & Faoziyyah Adenike AMOKEOJA 304-312

TEACHERS' CLASSROOM PRACTICES AND UPPER PRIMARY SCHOOL PUPILS' LEARNING OUTCOMES IN BASIC SCIENCE AND TECHNOLOGY, OGUN STATE
Tajudeen Gbenga AMUDA, Simeon Olayinka OLAJIDE, Ph.D., Isyaku MOHAMMED & Daniel OLUDIPE, Ph.D. 313-324

IMPACT OF MOTHERS IN STEM LEARNING FOR EARLY YEARS IN NIGERIA
Omowunmi Sola AGBOOLA, Ph.D. 325-334

INTEGRATION OF ARTS IN SCIENCE EDUCATION
Samirah Ahmed ABDULSALAM, Ph.D. & Rakiya SALEH, Ph.D. 335-347

DEMOGRAPHIC VARIABLES AND DIGITAL LITERACY OF MATHEMATICS STUDENTS IN SENIOR SECONDARY SCHOOLS IN OSUN STATE, NIGERIA

Rachel Oluwatoyin ADEBISI
E-mail: adebisir235@gmail.com; adebisiro@fceiwo.edu.ngbgs

Abstract
The inexhaustible use of computer and technology in this Information Communication and Technology (ICT) age has made digital literacy skills inevitable for all to sustain development. It is on this premise that the study examined demographic variables as determinants of digital literacy of Mathematics students in senior secondary schools of Osun State Nigeria. The study investigated the demographic variables of Mathematics students from the point of gender, age bracket group and school locations on digital literacy. The descriptive survey research design was adopted for the study. The study population consisted of all Mathematics students in senior secondary schools in Osun State. The sample for the study consisted of 360 students randomly selected through multi-stage sampling from one senatorial district. Digital Tools Assessment Questionnaire (DTAQ) used for data collection was scrutinised by two experts for content validity. DTAQ was found reliable at 0.80 through cronbanch alpha from 30 students outside the study area. One research question was raised and two hypotheses were tested at 0.05 level of significance. Correlation matrix, multiple regression and post-hoc analysis statistics were used for the analyses. The results of the findings showed gender correlated negatively while school locations age bracket group correlated positively with digital literacy. Findings also showed that older age bracket has higher influence on digital literacy than the lower age bracket. Further findings also revealed there is significant influence of the rural and urban schools on digital literacy with greater influence from urban schools. The study concluded that gender has no relationship on digital literacy but age differences and school locations have significant influence on digital literacy. The study finally recommended that efforts should be made on rural students' digital literacy improvement and the focus on the Mathematics students is germane because all the students are offering the subject.
Keywords: Demographic variables; digital literacy; Mathematics students; Senior Secondary Schools

Introduction

The world has gone technological and with the revolution brought by Information Communication and Technology (ICT) the young and old have become digitally inclined. The digital gadgets have redirected how people interact, communicate and associate in this contemporary time. The most interesting scenario is that digital gadgets are now being used as means to make life comfortable and their usage in education have acclimatised students to socio-technological world and the

benefits are practically utilized in all fields and carriers. Monisha and Kaur (2017) described digitalization as use of electronic technology in various disciplines that make the collection, processing and storage of data and information easier and convenient to a large extent and to access the needed data through the digital tools. With the quest for knowledge through the use of the internet by the youth and the students alike it is important for them to be vast on the use of digital tools. Literature review acknowledges that both basic skills of internet use and online content should be incorporated in digital skills for promoting digital literacy (Ester, Alexander, Jan & Jos, 2020). This implies that to be digital literate, an individual must know how to manage and interact using digital resources.

Digital literacy is referred to as the ability to understand and use information in multiple formats from a wide variety of sources when it is presented through computers particularly through the medium of the internet (Gilster, 1997). Digital literacy is a combination of both technical and cognitive abilities in using Information Communication and Technologies to access and provide information. Everything now is now digitised for usage, therefore it is of necessity that every student is digitally literate. The Organization for Economic Cooperation and Development (OECD) learning Framework 2030 emphasised that digital literacy is the basic for future education (OECD, 2018).Therefore, enabling students with digital literacy skills is a means of empowerment because the whole wide world is now socially mbedded into digital usage through the internet. Country like Nigeria has put into place the strategy on how to adopt digital technologies into all sectors. This is done to keep up with best global practices so that the current workers, youths, and other professionals will be digitally literate and in a ready mode for opportunities that may open within and beyond the shores of Nigeria, furthermore, this will help to diversify the economy significantly thereby reducing unemployment and enhancing labour productivity and mobility which in turn can improve investment and transform Nigeria into a country well known for technology, problem solving and critical thinking (National Digital Literacy Framework, 2023). The best and rewarding service is that education system should gear up towards arousing the interest of students towards digital resources and this cannot be done without incorporating digital literacy knowledge into the curriculum.

Alignment of digital skills with curriculum implementation could promote quality education for it would make the teachers to be versatile in employing virtual and blended learning of instructions and more so students could gain access to online library, and other instructions to scaffolds their learning and this make digital literacy skills inevitable to the process of education.

The Nigeria education reforms aims at eradicating poverty, job creation through planned curriculum like other developed countries Adebisi (2021), digital literacy could make this achievable. With growing interest of the youth to always be with digital tools, so its use for teaching and learning will be easy and promising to enhance performance and interest in most acclaimed difficult subjects like Mathematics and sciences. Learners will be attracted to a variety of other instructions

therefore curriculum activities should be well structured and sequenced to use digital tools extensively. There has been a notable shift in the teaching and learning processes in the past few years towards digitalization. Digitalization is now gaining ground in education sector also. One of the important use is education is that it used for capturing and sharing knowledge, audio and video recordings during classroom sections can be used to capture tacit knowledge to create knowledge repository (Nishat, 2018)

It is of note that research work to examine digital literacy skills on Mathematics students in secondary schools becomes imperative, because Mathematics is a subject that draws the attention of all disciplines and is compulsory for pupils and students at the primary and secondary schools respectively. So, Mathematics subject and its knowledge is for all. Mathematics is not only concerned with everyday problems, but is also involving the use of imagination, intuition and reasoning to find new ideas and to solve puzzling problems (Liaqat, 2015). Skills is needed for solving Mathematics problems as well in exploring of digital gadgets, and different characteristics are represented in Mathematics class known as demographic variables.

Demographic variables have been studied to consist of different characteristics such as age, gender, academic background of students' parents, ethnicity, school location and types. Demographic variables are set of characteristics that gives distinction to students across different situations (Ekpenyong & Joseph , 2021). Gender has been most noticeable and studied among demographic variables refers to a socio-cultural construct that connotes the differentiated roles and responsibilities of men and women in a particular society. Gender is ascribed as a psychological experience in explaining behaviours of an individual being born as either a male or female (Lahey, 2003; Umoh 2003); and in today's world both male and female are well dispose to digital tools and rudiment in Mathematics skills.

The knowledge of Mathematics is very important for human sustainability as well for digital competence. In 2017, UNESCO sensitizes people on digital literacy because of its importance in sustainability in this 21st century. This because with digital skills there will be unified knowledge could promote lifelong learning for all. According to Allan and Grudziecki (2015), digital literacy is a key cardinal factor in educating and enabling for employment and other aspects of social life and a means of gaining some understanding of the world for sustainable development.

In other to sustain a society, information should be handy to all and sundry without interruption and this is done through digital media. Today digital skills are required for meaningful and successful participation in the digital business to sustain the development. Sustainable Development (SD) has received attention over the years from international agencies, local and international conferences, academics and environmental activists (Ukaga, Maser, & Reichenbach, 2010). The attentions have kept on drawing influences that many seems to overlooked its prolific interpretation and implementations. According to Mensah and Enu-Kwesi,

2018; Tolba, (1984) Sustainable Development SD therefore stands the risk of becoming a cliché like appropriate technology—a fashionable and rhetoric phrase—to which everyone pays homage but nobody seems to define with precision and exactitude. The word sustainable from Macmillan Dictionary for Advanced learners capture sustainable "as capable of continuing for a long time at the same level,. With the aid of digital resources there are information from books, research, libraries to harmonise human resources and harness natural resources to give opportunity for future development without interrupting the present. This provides coordination of natural resources with human resources through digital resources for sustainability. According to Adebisi (2016), sustainable development is an uninterrupted development of any nation, that is, dynamism of a nation; with human and natural resources amalgamated to meet with challenges of the present and for future needs and benefits.

Statement of the Problem

The advent of Information Communication and Technology has brought about development in all areas of life and this has extended to the usage of digital resources and facilities in commerce, business, engineering, technology, transportation, medicines as well in process and products of education in this era of on-going development. With these advantages digital literacy is now the topical requirements of every day's life and plays an important role in sustaining development. Current researchers have shown that age is no barrier to digital acquisitions and urban students are more versatile in digital literacy but no much evidence to Mathematics students. It is now pertinent to examine digital literacy from the perspective of different characteristics represented at the secondary schools taking cognizance of Mathematics, a general subject because there are few studies on this; therefore the study was conducted.

Purpose of the Study

The study investigated demographic and digital literacy of Mathematics students in senior secondary schools in Osun State Nigeria. This was with a view to ascertain the relationship among the age group, school locations and digital literacy.

Research Question

This research question guided the investigation:

Are there any relationship between each of gender, age bracket group; school locations and digital literacy of Mathematics students in senior secondary schools in Osun State.

Hypotheses

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

Hypothesis 1: Age bracket group will not significantly influence Digital Literacy of Mathematics Students in Senior Secondary Schools in Osun State.

Hypothesis 2: School locations will not significantly influence Digital Literacy of Mathematics Students in Senior Secondary Schools in Osun State.

Methodology

The study adopted descriptive survey research design to investigate demographic variables as predictor of digital literacy of Mathematics students in senior secondary schools in Osun State, Nigeria. The design was considered relevant to the study because it is mainly for the collection of data in order to describe the present conditions of digital literacy of Mathematics students which will allow for generalization to an entire population. The population of the study consisted all Mathematics students in senior secondary schools in Osun State of Nigeria. A representative of 360 students constituted the study sample size from senior secondary school (SSS II) two Mathematics students selected through multi-stage procedure in this manner. One senatorial district was randomly selected out of which four Local Government Areas (LGA) were selected through simple random sampling technique. Three schools were selected through simple random sampling technique from each local government out of which 30 students were randomly selected for the study. Digital Tools Assessment Questionnaire (DTAQ) was self-designed research instrument for the collection of data for the study. DTAQ consisted of two sections. Section A elicited information on demographic variables of gender, school location and age bracket group while Section B contained 13 constructed items on basic skills and knowledge that an individual must possess in the use of technologies to make him or her digital literate. A three -point Likert scale was used for sections B on the responses of Adequate Knowledge (AK), Fair Knowledge (FK) and No Knowledge (NK). Two experts from the Department of Science and Technology Education, Obafemi Awolowo University helped to establish the content validity of the Digital Tools Assessment Questionnaire (DTAQ). The was done to ascertain the clarity, suitability and compliance of basic skills and knowledge that an individual must possess to use technologies completely and appropriately as operationally define in the study. The corrections, criticisms and useful suggestions of the experts were used for the final draft of the instrument. The pilot test was conducted by the researcher on a sample of thirty students outside the study area to establish the reliability coefficients of the instrument. This was determined by Cronbach Alpha and reliability of 0.80 was obtained and considered appropriate for the study.

Procedure for Data Collection

The researcher with the help of class teachers administered the instrument to the selected Mathematics students. There was 100% retrieval of the instrument from the respondents.

Data Analysis

Completed copies of the questionnaire were coded by the researcher. The statistical package for social sciences was used to analyse the data collected.

Results

Research Question One

Are there any relationship betweeneach of gender, age bracket group; school locations and digital literacy of Mathematics students in senior secondary schools in Osun State.

Table 1: Correlation matrix of Gender, school location, age and digital literacy skills

	Digital Literacy	Gender	School Locations	Age
Digital Literacy	1.00			
Gender	-0.083	1.00		
School Locations	0.220**	0.237*	1.00	
Age	0.237**	-0.035	0 .332**	1.00

** Significant ($p<0.05$)

Result from Table 1 shows that gender correlated negatively with digital literacy skills while school locations age bracket group correlated positively with digital literacy skills and both have predictive validity on digital literacy skills

Hypothesis One: Age bracket group will not significantly influence Digital Literacy of Mathematics Students in Senior Secondary Schools in Osun State.

Table 2: Age bracket group as a predictor of Digital Literacy skills

R=0.237 Adjusted R square = 0.51
R2=0.056 Standard Error = 6.08687

	Sum of Squares	df	Mean Squares	F	P
Regression	391.295	1	391.295	10.561	.001[b]
Residual	6594.899	178	37.050		
Total	6986.194	179			

b. Predictors: (Constant), Age

The Table shows that age bracket group alone accounts for 56% to the total variance in digital literacy. The percentage is significant. This implies that age bracket group determines the to greater extent digital literacy skills. The influence is very high. Hence the hypothesis which says age bracket group will not significantly influence digital literacy of Mathematics Students in senior secondary schools in Osun State is

therefore rejected.To ascertain where the difference lies, Bonferroni pairwise multiple comparison was used as shown in table 3.

Table 3: Bonferroni pairwise multiple comparison of digital literacy of age group

(I) Age	Age (J)	Mean Difference (I-J)	Standard Error	Significance
	15-17	-2.60735	1.23904	0.110
12-14	18-Above	-5.47246*	1.69165	0.004
15-17	12-14	2.60735	1.23904	0.110
	18-Above	-2.86511	1.38317	0.119
18>	12-14	5.47246	1.69165	0 .004
	15-17	2.86511	1.38317	0.119

The results in table 3 show that age bracket (12-14) has the least influence on digital literacy followed by age brackets (15-17) and age brackets (18 above) has highest influence on digital literacy. The difference is significant between age brackets (18 above) and age bracket (12-14). All of these show the influence of age bracket group on digital literacy.

Hypothesis Two: School locations will not will not significantly influence Digital Literacy of Mathematics Students in Senior Secondary Schools in Osun State.

Table 4: School locations as a predictor of Digital Literacy skills

R=0.220 Adjusted R square = 0.046
R2=0.048 Standard Error = 5.59745

	Sum of Squares	df	Mean Squares	F	Sig.	Remark
Regression	568.613	1	568.613	18.148	.000[b]	Sig.
Residual	11216.676	358	31.331			
Total	11785.289	359				

b. Predictors: (Constant), school location

The Table 4 shows that school locations alone accounts for 48% to the total variance in digital literacy skills. The percentage is significant. This implies that school locations determines the to great extent digital literacy skills. The influence is very high. Hence the alternative hypothesis which says school location will not significantly influence digital literacy of Mathematics students in Senior Secondary Schools in Osun State is therefore rejected.

Discussion of the findings

From the research question raised, the result of Correlation matrix of Gender, school location, age and digital literacy skills shows there is no relationship between the gender and digital literacy of Mathematics students in the study area. The results of the finding indicates that both male and female represented in the class of Mathematics are versatile in digital literacy tools which is as good as saying that implementation of higher digital literacy will not be difficult if facility are available because both male and female stand at the same level of literacy. The result is at variant to the report of Aesaert, Nijlen, Vanderlinde, Tondeur, Devlieger, & Braak, (2015) that stated that digital literacy of female students was correlatively higher than male students, also, (Markauskaite, 2005) and Meelissen, (2008) found the opposite result. These findings support the conclusion of Ertl and Helling (2011) that many studies showed interesting results where the development of digital literacy does not show a similar condition between males and females.

The first hypothesis tested that age bracket group will not significantly influence digital literacy of Mathematics students in senior secondary schools in the study area. The result of the findings shows that age bracket group determined to a great extent digital literacy of the Mathematics students. To ascertain where the difference lies, Bonferroni pairwise multiple comparison was used and the findings show that older age groups had greatest influence on digital literacy. This is in support of Vercruyssen, Schirmer and Mortelmaris (2023) that digital technology which enhances digital literacy has an empowering potential for older adults because it allows overcoming physical barriers and, thereby, facilitates contact with family and friends, and enables cultural participation access to information and services from home. Having the necessary digital literacy can increase independence of older people promoting their physical and mental well-being (Choi & DiNitto, 2013), prevent cognitive decline (Tun and Lachman, 2010), and is helpful to maintain identity (Martin, 2009). As such, increasing digitalization has been noted to have advantages for those older who are sufficiently skilled (Vercruyssen, Schirmer, & Mortelmaris, 2023)

The result of the second hypothesis testing shows that there is significant influence of school locations on digital literacy of Mathematics students in the study area. This is in line with research view as pointed by Pei-Yu (2013) that students from rural or migrant schools score lower on all the Internet inequality indicators (digital access, autonomy of use, social support, Internet use and self-efficacy) and are therefore more disadvantaged in internet usage status than their urban peers. The reason according to the findings of DipaliRailkar & PoonamKatyare (2014) is that there is lack of computers and experts to teach computer subject while in urban schools computers as well as teachers are available to teach the computer subject.

Conclusion and Recommendation

Digital literacy in this era of technological- societal world is worth investigating. To sustain the development, the students' digital literacy among

Mathematics students was focussed because the subject is a compulsory subject and different characteristics are in the class of Mathematics. Besides, Mathematics students should be conversant with digital tools to enable them acquire basic computer skills. Therefore, demographic variables of gender, age and school location were examined. Based on the findings, gender differences do not influence digital literacy among the Mathematics students in secondary schools. The finding implies gender equality in digital literacy. The study further concluded that age differences influenced the digital literacy and older age bracket are better digital literate than the young age bracket. The study in the finding discovered that urban students are influenced well than rural students on digital literacy. The study finally recommends that efforts should be made on rural students' digital literacy improvement and the focus on the Mathematics students is germane because all the students are offering the subject.

References

Adebisi, T. A. (2016). Towards acquisition of Physics knowledge and overview of strategies on sustainable national development and disaster management.*Journal of Emerging Trends in Educational Research and Policy Studies*, *7(4). 271- 275*.

Adebisi, T. A. (2021). Refocussing the Curricular and Assessments of STEM and TVET for human resources development in Nigeria. *African Journal of Educational Assessors*, 8 (2), 17-29.

Aesaert, K., Nijlen, V., Vanderlinde, R.., Tondeur, J., Devlieger, I., & Braak, J. V. (2015). The contribution of pupil, classroom and school level characteristics to primary school pupils' ICT competences: A performance-based approach Computer Education. 87, 55–69.

Allan, M., & Grudziecki, J. (2015).Overview of research on digital education. Open knowledge manipulation://opeknowledge-orgs/vis.php?id---query" digital %20education----base. Retrieved March 2018.

Choi, N., &Dinitto, D. (2013). Internet use among older adults: association with health needs, psychological capital, and social capital. *J. Med. Internet Res.* 15:e2333. doi: 10.2196/jmir.2333.

Dipali, R., & Poonam, K. (2014). A comparative analysis of Computer Literacy in rural and urban schools of Pune Region, *International Journal of Innovative Research in Computer Science & Technology (IJIRCST),* 2 (6), 51-55.

Ekpenyong, E .I. & Joseph. E. N. (2021).Students' demographic factors and their academic achievement in Mathematics and Physics *Prestige. Journal of Counselling Psychology*, 4(1), 121-129.

Ertl, B., & Helling, K. (2011). Promoting gender equality in digital literacy. *Journal Education Computer Research,* 45, 477–503.

Ester, V. L., Alexander, J. A. M., Jan, A. G. M. & Jos, J. (2020). Determinants of 21st-century skills and 21st century digital skills for worker. *A Systematic literature review*, SAGE, 1-14.

Gilster, P. (1997), *Digital literacy.* New York: Wiley Computer Publications.
Leley, H. (2003). *Discipline for self- control*. Upper saddle River, NJ: Prentice hall.
Liaqat, A. K.. (2015). What is Mathematics - an Overview. *International Journal of Mathematics and Computational Science*,1 (3), 98-101.
Markauskaite, L. (2005). Exploring differences in trainee teachers' ICT literacy: Does gender matter? Project. ICT Lit. pre-service Teacher Education. 1 1 , . 445–455.
Meelissen, M. R. M. (2008). Gender differences in computer attitudes: Does the school matter? *Computers in Human Behaviour*. 24 (3) 969–985.
Mensah, J., &Enu-Kwesi, F. (2018).Implication of environmental sanitation management in the catchment area of Benya Lagoon, Ghana.*Journal of Integrative Environmental Sciences*, 16, 23-43.
Monisha, B., K. &Kaur, J. (2017). Digitalization in Indian economy, BMIET *Journal of Science, technology and Management*, 1(1), 1-11.
National Digital Literacy Framework, (2023).
Nishat. Z. H. (2018.) Knowledge management in educational institutes with the help of digitalization. *International Journal of Trend in Scientific Research and Development (IJTSRD)*, 114-117.
OECD (2018). The future of education and skills: Education 2030. OECD. P21 Partnership for 21st century learning: A network for Battelle for kids. (nd). Retrieved from Battelleforkids: https://www.Battelleforkids.org/networks/p21.
Pei-Yu Wang (2013). Examining the digital divide between rural and urban schools: technology availability, teachers' integration level and students' perception. *Journal of Curriculum and Teaching*, 2(2), 127-137.
Tolba, M.K. (1984) A Harvest of Dust? Environmental Conservation, 11, 1-2. http://dx.doi.org/10.1017/S0376892900013424.
Tun, P., and Lachman, M. (2010). The association between computer use and cognition across adulthood: use it so you won't lose it? *Psychol. Aging* 25:560. doi: 10.1037/a0019543.
Ukaga, O., Maser, C., &Reichenbach, M. (2010). *Sustainable development: Principles, frameworks, and case studies*. CRC Press. https://doi.org/10.1201/9781439820636
Umoh, C.A. (2003). A theoretical analysis of the effects of gender and family education on human resource development.*Journal of Curriculum Organization of Nigeria*, 10 (1) 1-4.
Vercruyssen, A., Schirmer, W., &Mortelmaris, D. (2023). How “basic” is basic digital literacy for older adults? Insights from digital skills instructors. *Frontier Education.* 8:1231701.doi: 10.3389/feduc.2023.1231701.