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Reconnaissance on the Proficiency of the Science Students' Usage of ICT at Ekiti State Univesity, Nigeria

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ABSTRACT

This research focused on reconnaissance of the proficiency of the physics students' usage of ICT in Ekiti State University, Kwara State College of Education, Oro Campus. The results reveal varying levels of ICT proficiency among students, with significant gaps in practical skills and critical thinking. While students demonstrated familiarity with basic ICT tools, they struggled with advanced applications and integration in scientific inquiry. The study identifies key challenges, including inadequate training, limited access to resources, and insufficient curriculum integration. Educators' ICT self-efficacy and teaching practices also emerged as influential factors. The findings inform strategies to enhance ICT integration in science education, including professional development for educators, curriculum redesign, and infrastructure upgrading. This reconnaissance contributes to the understanding of science students' ICT proficiency, providing valuable insights for educators, policymakers, and stakeholders seeking to harness ICT's potential in improving science education.

Keywords: Reconnaissance, Proficiency, Science, Students, ICT

1.0 Introduction

Science is any systematic knowledge-based or prescriptive practice understood as a highly skilled technique or practice. It is branch of study dealing with a body of facts or truth systematically arranged and showing the operation of the general laws in more contemporary term. Science is a system of acquiring knowledge based on the scientific process in order to organise a body of knowledge gained through research. It is also known as the observation, identification, description experimental investigation and theory explanation of natural phenomena (Projectclue, 2023). This science comprise of Biology, Chemistry and Physics. The Scientists made observations of natural phenomenon and then through experimentation they tried to stimulate natural events under control conditions. Based on the observation, a scientist may describe the phenomenon in terms of mathematical and logical representation.

Physics is a science that deals with the fundamental constituents of the observable universe. It is the study of natural world both seen and unseen. It is an important area of study that allows scientist to understand the world, the environment and interaction between objects in a system. Understanding our world allows for appreciation, conservation and innovation of the world around us (Muianya, 2018). Physics evolved from an attempt by ancient researchers to understand the working of their immediate surroundings to a body of mathematical description and paradoxical physical interpretation. The ultimate of physics is to find a unified set of laws governing matter, motion, and energy at small (microscopic) subatomic distance, at the human (macroscopic) subatomic scale of everyday life and out to the largest distance.

This ambitious goal has been realized to some notable extent (Britanica, 2023). Physics is also a science oriented course or discipline known for its physical nature. Its teaching is to bring about scientific stable students, a mind-set that requires the students to test and experiment (Samphina Academy, 2023). Physics Education deals with sharing of science content and process with individual who are not traditionally considered to be member of the scientific community, the Individuals could be students, farmer, marketers or even a whole community. Physics Education in Nigeria concentrate on the teaching of science concept, method of teaching and addressing micro conceptions held by learners regarding science concepts (Projectclue, 2023). As science is about finding new things discoveries (Kushwaha & Singhal, 2017). It is obvious that evolve of science and technology would have not been possible without physics Education. For instance, engineering, medicine, architecture etc. will not be possible if there is no one to teach the students the core subjects needed for the course. Importantly it is needed in the development of any nation that is why every nation must take very serious in all institution of learning. Many developed countries of the world were able to achieve so much in science and Technology because of physics Education (Projectclue, 2023). Information and Communication Technology (ICT) offers the users opportunity to get the required information via Telecommunications (IJITEE, 2020). ICT has been given many variation and can be quite broad, defining the best one to use will allow you to successfully use ICT in learning (ICTE, 2023). In all aspect of life,especially in Education, the use of ICT has become a common and very popular tool to achieve goals and purposes especially among students (IJITEE, 2020). ICT in Education improves academic engagements and knowledge retention.

With the integration of ICT into learning process, students become more engaged in their day-to-day academic activities. This is because the technology provides diverse opportunities to make use of while studying and also make learning more fun and enjoyable. It also enables learner to learn and understand difficult concepts through simulation and Artificial Intelligence. It facilitates critical thinking and fosters retention (IJITEE, 2020).

The role of ICT according to Ajayi and Ajayi (2020) is to enhance communication and allows access to information anywhere in the world, promote inter-connectivity that is not restricted by boundaries, language and culture. The availability of ICT infrastructural resources as emphasized by (Nguyen 2017), in the rural schools, is a key component for the provision of quality Education. The use of ICT in promoting Science Education as prevalent in developed countries have generally developed positive attitude towards electronics learning and other ICT professions. ICT skills and competencies increase person's learning abilities. Competencies are associated with quality of technologically educated person, prepared for life and active work in the environment of modern high-tech information.

The further implementation of ICT will ensure improvement in educational process (Alina, Dzhurlo, Oksanna and Shparyk, 2019). ICT had influenced how we interact and gather information (Sheringham, 2023). Students are now conversant with the use of ICT operating through smart devices and internet. So it is needed to measure students' behaviour towards ICT usage and also its effect on the students' performance in their subjects (Researchgate, 2024).

1.1 Statement of the problem

Despite the increasing importance of Information and Communication Technology (ICT) in enhancing science education, there is a growing concern that science students in Ekiti State University in affiliation with Kwara State College of Education, Oro Campus lack the necessary proficiency in utilizing ICT tools to support their learning. This deficiency may hinder their ability to effectively integrate technology into their academic pursuits, ultimately impacting their academic performance and preparedness for the digital workforce.

Specific Problems are as follows;

1. Limited exposure to ICT tools and resources among science students.
2. Inadequate training and support for science students to develop ICT skills.
3. Insufficient integration of ICT into science curricula.
4. Unclear understanding of the benefits and applications of ICT in science education.
5. Potential digital divide among science students, affecting their ability to access and utilize ICT resources.

1.2 Research Questions

1. What is the current level of ICT Competency among science students and access to ICT for learning ?
2. How often do the Students use ICT to learn?
3. How do science educators integrate ICT into their teaching practices?
4. What differences exist between the use of ICT facilities and printed media for learning Science?

2.0 Methodology

The study employed a descriptive research of survey type. The population consisted of all the degree students with science background in Ekiti State University Ado-Ekiti in affiliation with Kwara state College of Education, Oro, Nigeria. The sample for the study consisted of 120 students. The data were analyzed descriptively using frequency counts and percentages.

2.1 Results

Question 1: What is the current level of ICT Competency among science students and access to ICT for learning ?

Table 1: percentage analysis of current level of ICT Competency among science students and access to ICT for learning

Response	**Frequency (N)**	**Percentage (%)**
Do you have access to ICT leaning devices like Computers, cellphones, tablets etc?		
YES	96	80.0
NO	24	20.0
Total	120	100.0

Are you accessing any digital learning resources like web-pages, blogs and others?		
YES	78	65.0
NO	42	35.0
Total	120	100.0
Are you skilful at using ICT for learning purposes?		
YES	69	57.5
NO	51	42.5
Total	120	100.0
Do you have access to ICT learning facilities like zoom, Google class, Google meet, whatsApp, Facebook etc ?		
YES	56	46.7
NO	64	53.3
Total	120	100.0
Are you competent in the use of ICT for academic learning?		
YES	70	58.3
NO	50	41.7
Total	120	100.0

The table above shows that majority of the respondents (80%) have access to ICT learning devices while only 20**%** have no or less access to the devices. This indicate that most students are conversant with the various ICT learning devices. The table further revealed that 65% of the respondents could access the learning resources and 35% showed no concern about accessing the available learning resources. The table also showed that 57.5% of the students do use ICT facilities to learn while the remaining 42.5% cares not to use ICT for learning purposes. Only 46.7% of the respondents have access to ICT learning learning facilities while 53.3% of them have no access to the facilities. The table also showed that 58.3% of the respondents are competent in the use of ICT to learn. while 41.7% are not competent in the use of using ICT to learn. The students sampled have a high level of competency in ICT and also privileged in applying such for academic purposes.

Question 2: How often the students use ICT to learn?

Table 2: percentage analysis of frequent usage of ICT to learn

Response	**Frequency(N)**	**Percentage (%)**
Do you use ICT frequently for learning?		
YES	59	49.2
NO	61	50.8
Total	120	100.0
Do your teachers ever use ICT to teach in the class?		
YES	22	18.3
NO	98	81.7
Total	120	100.0
Have you ever receive online lectures?		
YES	36	30.0
NO	84	70.0
Total	120	100.0
Have you been receiving online assignments?		

YES	27	22.5
NO	93	77.5
Total	**120**	**100.0**

From table 2, only 49.2% of the respondents do use ICT often to learn, 50.8% do not care to use ICT to learn but for other purposes. The table further indicated that 18.3% of the students have their teachers teaching them through the use of ICT while 81.7% of them have no privilege of been taught through the use of ICT. 30% of the respondents have ever received online lectures while 70% them that have never received online lecture. The table showed that 22.5% of the respondents have been receiving online assignments while 77.5% of the students have never received any online assignment. In summary, majority of the students sampled are not using ICT platforms for their academic purposes instead, they use the opportunity for socialization.

Question 3: How do science educators integrate ICT into their teaching/learning of Science?

Table 3: Percentage analysis of how science educators integrate ICT into their teaching/learning of Science

Response	**Frequency (N)**	**Percentage (%)**
Use of ICT is made a priority in Science Education teaching in my school		
YES	65	54.2
NO	55	45.8
Total	120	100.0
Using ICT in teaching and learning science is one the best approach in Science Education		
YES	72	60.0
NO	48	40.0
Total	120	100.0
Use of ICT is a necessity for students to finish their courses?		
YES	38	31.7
NO	82	68.3
Total	**120**	**100.0**

The table 3 showed that 54.2% of the respondents agree that ICT is made a priority in the teaching and learning science while the remaining 45.8% gave a negative response. The table further revealed that 60% of the respondents were pleased with the assumption that ICT is one of the best approaches for learning sciences and 40% were not favourably disposed to the idea. The table also indicated that 68.3% of the respondents disagree that ICT should be a necessity for students to finish their courses in science education, while 31.7% were favourably disposed to the idea.

Question4: What differences exist between the use of ICT facilities and printed media for learning Science?

Table 4: Percentage analysis showing the differences that exist between the use of ICT facilities and printed media for learning Science?

Response	**Frequency (N)**	**Percentage(%)**
Getting information from ICT is better than using printed materials		
YES	63	52.5
NO	57	47.5
Total	120	100.0
Use of ICT treats difficult concepts better then prints		
YES	89	74.2
NO	31	25.8
Students find it easier using ICT facilities for learning science than prints		
YES	84	70.0

NO	36	30.0
Total	120	100.0
Use of ICT allows flexibility during studying and increases learning resources		
YES	62	51.7
NO	58	48.3
Total	120	100.0
Using ICT in the class makes the subject matter more interactive for students		
YES	64	53.3
NO	56	46.7
Total	**120**	**100.0**

Table 4 showed that 52.5% of the respondents prefer using ICT to source academic information than printed materials, 47.5% of them do not prefer it. Majority of them (74.2%) agree that use of ICT is better in treating difficult concepts than prints, while 25.8% disagree. The table showed further that 70% of the respondents are comfortable using ICT to learn and 30% are not comfortable using ICT to learn. The table also indicated that 51.7% of the respondents agreed that learning process is flexible through the use of ICT than prints the remaining 48.3% disagreed. It was indicated that 53.3% of the respondents agreed that using ICT in the class makes the subject matter more interactive for students while 41.7% do not agree.

2.2 Discussion

Findings of the study revealed that science students of Ekiti state university Oro campus are in a good position to use ICT for learning science courses, because from the findings majority of them have a positive attitude towards using ICT in learning science. This was in agreement with Muianya, (2018) who agreed that people all over the world appreciate the use of ICT. ICT in teaching and learning of science courses would help to persuade the students to have more favourable attitude towards the sciences. In summary, the students sampled have a high level of competency in ICT and also privileged in applying such for academic purposes. This could be due to the fact that virtually all youths in Nigeria are privileged in possessing at least an ICT equipment like cellphones and are connected to the internet for their day-to-day activities.

Findings of this study further revealed a higher percentage of the students do not use ICT for academic purposes. Although most of the students had the basic knowledge of ICT facilities usage but they are not utilizing them for academic purpose. This finding was in support of the work of Ajayi and Ajayi, (2020) who observed that most youths are not utilizing the ICT facilities for academic purposes but for socialization and communications only.

Findings of this study also showed that ICT is made a priority in the teaching and learning science. This finding is in agreement with Nguyen, (2017) who worked with some schools in rural settings and discovered that ICT is a key component for the provision of quality Education.

Findings of the study revealed that most students prefer using ICT to source academic information than printed materials. This might be due to the fact that digital devices are accurate and cover a wide range of materials for learning. This finding is in agreement with Sheringham, (2023). who observed that students are now conversant with the use of ICT operating through smart devices and internet.

3.0 Summary

This study investigated the proficiency of the science students' usage of ICT at Ekiti State University, Oro campus. The sample for the study comprised of 150 students from different departments regardless of their sex and level. The research instrument used for the study was a structured questionnaire, which was designed by the researcher and validated by Test and Measurement experts. The data collected were analysed using frequency counts, and percentages.

4.0 Conclusions

The impact of Information and Communication Technology (ICT) has been recognized in almost all sectors of modern life. The integration of ICT into science education could assists both teachers and students in accessing information and subsequently improve students' learning outcomes. The application of ICT is fundamental to the teaching and learning of science although not without some challenges in its integration The challenges include poor ICT infrastructure, lack of standard ICT policies, poor Internet and network facilities, poor power supply and lack of professional development program.

5.0 Recommendations

Based on the findings, the following recommendations were made:

1. Policy makers and curriculum developers should integrate the use of ICT into science curricula to enforce every teacher and student in the use of ICT for academic purposes.

2. Government and all academic stakeholders should invest in ICT infrastructure by upgrading hardware, software, and internet connections for effective ICT usage.

3. Government should allocate resources for ICT infrastructure and provide funding for schools to upgrade ICT facilities for learning.

4. Promote digital literacy by incorporating ICT skills into national education policy.

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