IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TEACHING OF INTEGRATED SCIENCE SECONDARY SCHOOL IN ILORIN METROPOLIS

BY

ALADE ABIBAT ABIDEMI

KWCOED/IL/22/0544

A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INTEGRATED SCIENCE /BIOLOGY, KWARA STATE COLLEGE OF EDUCATION, ILORIN.

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF NIGERIA CERTIFICATE IN EDUCATION, (NCE)

AUGUST, 2025

CERTIFICATION

This project has been read and approved as meeting the requirement of the award of Nigeria Certificate Education (NCE) in the Department of Integrated Science / Biology, Kwara State College of Education, Ilorin.

DR. Amao D. O Project Supervisor	_____ Signature	_____ Date
Mr. H,B Bisiriyu Head of Department	_____ Signature	_____ Date
_____ Project Coordinator	_____ Signature	_____ Date

DEDICATION

I dedicate this project work to Almiighty Allah and to my Parents

ACKNOWLEDGMTS

My profound gratitude, aduration be unto Allah the most compassionate, the merciful, who creates us and also gave strength wisdom, ability and also allow me to complete this course successful, may his name be praise forever.

I acknowledge the effort of my Supervisor Dr. Amao David O. for his advice and guidance and all other lecturers in the school of science department.

I also express my profound gratitude to my brothers and sisters for their support in terms of moral, finance, material, and prayers towards the success of my programme.

My appreciation straightly goes to my lovely Mr. and Mrs Alade for their caring, love and finances through the course of my NCE programmes, may Almighty Allah let you reap the fruit of your labour amen.

ABSTRACT

This research project examines the impact of ICT on students' Academic performance in Secondary Schools in Ilorin Metropolis Kwara State. The main objective of the study is to validate and authenticate the impact of ICT on the performance of student through evaluation of different areas where the utilization of ICT can affect teaching and learning process. The research work employs descriptive research methodology while the theoretical/conceptual review of the research topic was vividly carried out. The sample for the study was taken from ten selected secondary school in Ilorin metropolis using a simple random sampling of respondents' opinion. Primary data was gathered by administration of questionnaires to 80 randomly selected respondents. After careful analysis of the formulated hypothesis using chi-square test, it was concluded that ICT has great impact on student academic performance. However, findings indicated that there are poor ICT infastructural developments in Ilorin Metropolis Kwara State. The following recommendations are put forward Government at various levels should ensure adequate provision of Information Communication and Technology (ICT) tools in the Junior secondary schools and indeed, at the other levels of education to support teaching and learning Integrated Science teacher should be trained accordingly on the handling procedure and efficient utilization of available ICT tools to complement Integrated Science teaching. Integrated Science teachers should be more committed to their teaching job by utilizing the available ICT tools/ in teaching Integrated Science appropriately.

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CHAPTER ONE

INTRODUCTION

Background to the Problem

Science provides a body of knowledge for use in addressing various forms of human, material and environmental problems. It can also be viewed as composed of two major complementary modes: accumulation of knowledge through exploration and discovery efforts about the natural world, and the use of such knowledge for human and material development (Adegbite, 2000). Science is studied and practised in all parts of the world, including Nigeria. Nigeria as a developing nation with an increasing demand for science based on skilled manpower. The achievement of this can start with the teaching and application of science subjects as in Integrated Science at secondary school level (Ahmed, 2018).

Science is a human enterprise primarily concerned with finding out about things in our environment. It has become an integral part of the world's culture. Effective science teaching is the gateway to attainment of scientific and technological greatness (Oguniyi, Okebukola & Fatunwase, 2018). Science has an important role to play in the social, economic, and political development of any nation. The main distinction between the developed and developing countries is due to the degree of scientific development in these countries. United States, United Kingdom, Russia and China are typical examples of nations which are referred to as developed, as a result of their development in the area of Science and Technology (Agbaje & Alake, 2017). Ogunleye and FIlorin Metropoliskin

(2022) emphasized that scientific knowledge of a country helps in boosting national prestige, military might, national income and international rating.

There had been worldwide recognition of importance of science and science education in national development and this has found a central place in the curricula of schools at all levels (Ogbonna, 2017). According to Olasehinde and Olatoye (2017), Science education is designed to guide the world toward a scientifically literate society and this is important for an understanding of science as it offers personal fulfillments and excitements. Integrated Science is usually regarded as the most difficult to understand among all the science subjects and thus it is the one that usually attract the lowest enrolment. Ofoegbu (2017) had asserted that Integrated Science has a low student enrolment than any other science subject especially at the upper basic level of the Nigerian education.

Integrated Science is an important area of focus in national development all over the world. This is because Integrated Science plays a vital role in the technological transformation of any nation. In Nigeria, there seems to be an increased awareness that Integrated Science plays an important role in influencing the rate of economic and technological growth. It has equally been realised that Integrated Science has the capacity to solve the age-long problems of increasing unemployment, high poverty rate and insufficient manpower. According to Ogbu, (2018) Integrated Science provides theoretical bases for synthesis of drugs which are used for medicine, textiles, shoes, plastics, soap and detergent. Contributing to the importance of Integrated Science in national development, Igbonugo (2017) pointed out that Integrated Science helps to ensure continuous

availability of students in expected number who take important professions such as medicine, pharmacy, dentistry, food science, agriculture, engineering, education, etc.

The integrated use of ICT in subject curricula and classroom teaching and management, is a complex process, which is usually achieved by following a set of guiding parameters. In this module, there are two complementary activities: the first focuses on the theories and principles that underpin ICT integration in education; and the second is teachers' computer-assisted practice in the use of ICT with support web-based portals (Ahmed,2021).

Adeyemo (2020) further argued that method of teaching has gone beyond traditional methods and this makes the integration of information technologies very important in science class. Information technology has broken the monopoly, and provided varieties in teaching–teaching situation in Integrated Science. This means that information technology should be properly rooted in both Junior and senior secondary school curriculum so that the level of literacy will be increased with regard to the use of information technology in teaching Integrated Science.

The teacher alone cannot provide all the needed condition for an effective teaching process, other supporting materials should be provided. The students learn better with the use of appropriate instructional materials. The use of information and communication technology (ICT) in teaching of Integrated Science has added a new dimension in the positive promotion of the teaching process fafunwa (2019). It provides the much need sensory experiences needed by the learners for an effective and meaningful behavioural change. Information and communication technology are meant to improve the quality of

education for effective academic performance of students in schools. The performance of the students on the intended teaching outcome provide the validation – loop on the success of the interaction and instruction (Bakare, 2019).

Information and communication technology (ICT) may be defined as that feature of technology which deals, with the handling and processing of information, utilizing a wide variety of electronic gadgets in facilitating communication and teaching of ICT amongst different technologies appears to have changed numerous features of human life impressively than some other scientific innovations. In Nigeria, forexample, ICT has changed the business, communication, and information segments. Numerous administration exchangesare presently being done through ICT; it was even reportedthat the 2011 general elections would have been through electronic voting machine (an ICT) (Vikoo2013). The Federal Republic of Nigeria (2014) declared that ICT is a workmanship and connected sciences that deal with information communication. It encompasses all gear (counting computational apparatus, PCs, equipment, programming, instruments, strategies, practices, forms, methodology, ideas, standards, and the sciences) that become an integral factor in the conduct of information exercises: obtaining, portrayal, handling, introduction, security, trade, exchange, administration, association, stockpiling, recovery, of data information. This subsequently demonstrates ICT is an imperative piece of the contemporary world. ICT can be utilized to improve instructing of Integrated Science. Integrated Science is a discipline that deals with the investigation of living things. Integrated Science is one of the science subjects that is offered in the Junior / Basic secondary school level. Igwe (2017) depicted science as a methodical investigation of the

idea of the material practices and physical universe through perception, experimentation, estimation and recording.

Ahmed, (2018) It is observed that the influence of ICT on education is to advance the capacity of every learner to generate access, adopt and apply knowledge and information to tackle complex issues. ICTs are one of the significant contemporary factors inshaping the now worldwide economy and creating rapid changes in the general public. It has essentially changed the way individuals learn, communicate and do business (UNESCO, 2012). Nonetheless, in acknowledgment of the prominent role of ICT in advancing teaching and important skills, it is expressed in the national policy on education that for viable functioning, in present day world, there is an urgent need to incorporate ICT into Nigeria Education System. According to NITDA (2013), ICT is having a revolutionary influence on educational methodology worldwide. Regardless, this transformation is not across the board and should be fortified to achieve a substantial level of the populace. Theories used in this study are the Behaviourist and the Constructivist theory. Behaviourist theory believes that individuals can learn more efficiently if their environment is prudently organized. The Constructivist theory highlights the significance of teaching based on experience. The instructors act as facilitators and the students plays a dynamic characterin the teaching process. The reasons why these teaching theories were used is that they focus on the person. They focused on the significance of the teacher student relationship and the significance of research needing to be a collaborative exercise with practicing instructors (Avwiri and Phimiah, 2020).

Avwiri and Phimiah (2020) examined the use of ICT gadgets for instructional conveyance in secondary schools in Ebonyi State, Nigeria. it was established in addition to other things that ICT gadgets are not adequately available, most accessible ICT gadgets are not in good working condition in schools, studied, along these lines are not sufficiently utilized and trained staff are not also adequately accessible to operate the functional ones. Apagu and Bala (2015) examined the accessibility and use of ICT for instructing Vocational and Technical Education in Yobe state. The investigation discovered that ICT services were insufficient in specialized schools. ICT, for instance, computer, TVs, CCTV et cetera are not adequately available in schools. Educators/learners‟ level of experience in the usage of ICT in schools was low. Ofodu and Oso (2015) explored the level of English Language secondary teachers' Information and Communication Technology resources utilization. The results demonstrated that instructors‟ level of awareness to information and communication technology resources was high however the level of utilization was low. Similarly, it was established that the level of educational skillsof the instructors was low.

Statement of problem

Despite the wide recognition and acceptance accorded on ICT utilization in teaching Integrated Science at the Junior Secondary School level, there seems to be problems in the utilization of ICT in teaching Integrated Science. There is need to sensitize Integrated Science teachers to effectively utilize ICT in teaching Integrated Science and also make government committed in providing the necessary environment for ICT instruction in our Junior Secondary School remains daunting. The overall expectation is

that Integrated Science teacher's participation by eliciting their perceptions on the factors affecting effective utilization of ICT in teaching Integrated Science would reawaken them to be more committed to the use of ICT in teaching Integrated Science as well as making them serve as agents in the spread of the effective use of ICT for the teaching of Integrated Science.

The literature has reported that inspite of Nigeria rich instructional resources endowment; there has been a gradual decline in students' interest in Integrated Science at secondary school level (Manyong, 2018). There is nonchalant attitude among some secondary school teachers to make use of information communication and technology to supplement their conventional method of teaching in Integrated Science instruction (Adeagbo, 2017). This to large extent affects the expected performance of student in Integrated Science, inspite of the emphasis being placed on Integrated Science as one of the core and compulsory science subjects in junior secondary schools.

Studies revealed that most Integrated Science teachers has strong interest to finished the prescribed school syllabus for Integrated Science before the external examination–Junior School Certificate Examination (JSCE) conducted by National Examinations Council (NECO) (Ibrahim, 2017; Bakare, 2019, Ajayi, 2018). Hence, the prosecution of a functional education in relation to Integrated Science in secondary schools still leaves much to be desired. In view of these difficulties, most teachers of Integrated Science still resort to the theoretical method of teaching the subject. It was also observed that gender, qualification and the years of teaching experience of a teacher play significant role in their utilization pattern as regard information and communication technology tools

to the teaching approach (Adeyemo 2020 & Adeyemi, 2022). This undoubtedly, is contrary to the improvement of Integrated Science education, which is greatly needed at this period of our development with emphasis on practical oriented teaching (Mammudu, 2019).

The importance of information communication and technology to the successful implementation of the new Integrated Science curriculum cannot be over emphasised. This is because the use of information communication and technology is very important for effective behavioural change in learners (Jimoh, 2019). This is why Adekunle (2018) in Olokoba (2022), noted that when the students are given the chance to learn through more senses than one, they can learn faster and easier. On the contrary, the researcher observed that Integrated Science snd information communication and technology are lacking, even the few available in the schools are not in good condition while teachers hardly have access to the few available due to their incompetent and experience. This become a concerned to the researcher because of what will be the interest, competence and performance of the students in Integrated Science if there are not taught with relevant and approved information communication and technology. This research work therefore intends to find out the impact information and communication technology in teaching Integrated Science in Junior secondary school in Ilorin Metropolis, Kwara State.

Purpose of the Study

The major purpose of this study is to find out the impact ICT in teaching Integrated Science in Junior secondary school in Ilorin Metropolis Kwara State.

Specifically, the study will find out;

i. The level of impact information and communication technology for teaching of Integrated Science in Junior secondary schools.

ii. The level of impact information and communication technology for teaching of Integrated Science in Junior secondary schools on the basis of teachers gender.

iii. The level of impact information and communication technology for teaching of Integrated Science in Junior secondary schools on the basis of teachers academic qualification.

iv. The level of impact information and communication technology for teaching of Integrated Science in Junior secondary schools on the basis of teachers years of teaching experience.

Research Questions

The following research questions was guided the conduct of this study.

1. To what level does impact of information and communication technology for teaching Integrated Science in Junior secondary schools in Ilorin Metropolis L.G.A. Kwara State?
2. To what level does of impact information and communication technology in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis have influence on the teacher gender?
3. To what level does impact of information and communication technology in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis have any influence on teachers academic qualification?

4. Does the level of impact of information and communication technology in teaching of Integrated Science at junior secondary schools in Ilorin Metropolis have any influence on teachers' years of teaching experience?

Research Hypotheses

The following hypotheses were formulated to guide the conduct of this research;

Ho_1: There is no significant relationship between impact of information and communication technology based on effective teaching of Integrated Science at junior secondary schools in Ilorin Metropolis.

Ho_2: There is no significant relationship between the impact information and communication technology based on teacher gender in teaching of Integrated Science at junior secondary schools in Ilorin Metropolis.

Ho_3: There is no significant relationship between the impact information and communication technology based on the teacher academic qualification in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis.

Ho_4: There is no significant relationship between the impact information and communication technology based on the teacher years of teaching experience in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis

Scope of the Study

This study is carried out to investigate the Impact of ICT in teaching of Integrated Science in Junior Secondary School. The geographical coverage of the research is Ilorin

Metropolis, Kwara State, and the study was carried out among selected Junior secondary schools. However, the study was limited to only 10 secondary schools within Ilorin Metropolis . Thirty (30) respondents were involved in the study.

Significance of the Study

This study would be of great benefit to provide useful information to students, teachers, school proprietors, educational planners, and government.

The finding will equally be of great value to students under training to acquire and develop required skills, knowledge, interaction, concentration and rudiments on how information and communication technology help teachers to make the delivery of their instruction successful to the students in the classroom.

The study is significant in the sense that it would help in the teachers understand the need for the integration, effectiveness and usefulness of information and communication technology for teaching process in Integrated Science classroom activities. It would be of great help to school administrators in casting some light on the information and communication technology as part of school evaluations strategies in the schools under study.

It is hoped that the findings of this research would also go a long way to enlighten the agencies of education, the government, the lovers of education and the readers on which can be done further to improve the position of instructional materials utilization in teaching process. It is hoped that the findings of the study will assist the government on the need to adequately equip educational institutions with up to-date and correct materials that will aid teaching process.

The study would equally serve as a basis for further study to other researchers who may want to investigate on the availability and level of use of information and communication technology at Junior secondary school in Ilorin Metropolis , Kwara State.

Clarification of Major Terms and Variables

The following terms and variables were defined operationally;

Integrated Science: Is a branch of science that deals with study of nature and properties of all forms of matter and the various changes that these substances undergo in different conditions.

Gender: Refers to teachers social and cultural construction and representative of being 'male' and 'female'.

Science: Is a vast body of connected knowledge of theories and facts developed by scientists through scientific methods.

Information communication technology: refers to a wide range of software technology components such as computer, telecommunication, internet, video and digital cameras that can be used by teachers to support their work (Wikipedia).

Teachers Qualification: This refers to the academic competences and certification completed by Integrated Science teacher in secondary school that qualifies him for teaching.

Teacher Experience: This refers to extents of job engagement that accrued to Integrated Science teachers in service.

CHAPTER TWO

LITERATURE REVIEWED

This chapter is concerned with the review of related literatures on the impact of ICT in teaching Integrated Science in Junior secondary school in Ilorin Metropolis, Kwara State. This can be presented under the following sub-headings:-

- Theoretical framework of the Study
- Contents and Objectives of Junior Secondary School Integrated Science Curriculum
- Empirical Study on Information and Communication Technology on availability and utilization to Integrated Science teaching

- Influence of ICT tool in teaching in schools
- Concept of the needs for ICT Integration in Teaching in secondary Schools
- Factors Affecting the Utilization of ICT in Teaching of Integrated Science
- Influence of Teachers' Academic Qualification on utilization of ICT on Teaching Integrated Science
- Influence of Teachers' Years of Teaching Experience on utilization of ICT in Teaching Integrated Science
- Studies on Importance and Uses of Instructional Materials on utilization of ICT in Teaching Integrated Science
- Appraisal of the Reviewed Literature

Theoretical Framework of the Study

The study is based on Everett Rogers' Diffusion of Innovations theory (Rogers, 2019). Rogers' Diffusion of Innovation theory is the most appropriate for investigating the adoption of technology in higher education and educational environments (Medlin, 2022; Parisat, 2020). Diffusion of innovation is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. Rogers argues that diffusion is a process by which an innovation is communicated through certain channels over time among the participants in a social system. The origins of the diffusion of innovations theory are varied and span multiple. The four elements in the diffusion of innovations theory are: innovation, communication channel, time and social system.

INNOVATION refers to an idea, practice, or project that is perceived as new by an individual or other unit of adoption. A communication channel is a means by which

messages get from one to another; time refers to length of period or duration required to pass through the innovation- decision process and lastly, social system is defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal.

According to Rogers (2019), the innovation decision process has five steps which are: knowledge which refers to an individual's awareness of an innovation and having an idea of how it functions. Persuasion is the second stage and it occurs when the individual has a negative or positive attitude toward the innovation. According to Sherry, (2020), teachers usually seek for information about a new innovation that is usually available from outside experts.

The decision stage is the third one whereby an individual chooses to adopt or reject the innovation, that is, by engaging in activities that lead to choice to adopt or reject the innovation. The implementation stage is the fourth where the innovation is put into use by the individual. The implementer may need technical assistance from change agents and others to reduce the degree of uncertainty about the consequences. Finally, the confirmation stage where an individual evaluates the results of an innovation decision already made. This compels the user to continue adopting or later on reject the technology.

Science is a discipline comprising knowledge, skills and scientific attitudes and noble values. The integration of these three elements is very important in ensuring a quality science education. As a discipline of knowledge, science provides a conceptual framework that will enable students to understand the world around them. Science is also a process that emphasises inquiry and problem solving. Thus, science develops skills in

investigating the environment, which involves thinking skills, thinking strategies and scientific skills. Knowledge is therefore acquired as the product of an investigation. Scientific inquiry also requires and enables students to develop scientific attitudes and noble values (Dienye, & Gbamanja, 2020).

The core science subjects for the primary and lower secondary levels are designed to provide students with basic science knowledge, prepare students to be literate in science, and enable students to continue their science education at the upper secondary level. Core science at the upper secondary level is designed Integrated Science Syllabus to produce students who are literate in science, innovative and able to apply scientific knowledge in decision-making and problem solving in everyday life. The elective science subjects prepare students who are more scientifically inclined to pursue the study of science at post-secondary level. This group of students would take up careers in the field of science and technology and play a leading role in the field for national development.

Contents and Objectives of Junior Secondary School Integrated Science Curriculum

Objectives are short- term and precise statement of educational intentions which describes specific performance oriented and behavioral terms those educational outcomes expected from the learners in the course of exposure to specific experiences (Okunloye, 2020). Abdullahi (2018) defined curriculum as part of the academic programmes specifically designed to provide planned and guided teaching experience. Curriculum is defined by Usman (2018) as an organized body of knowledge provided by the school to modify the behaviour of the learner. It is aimed at bringing permanent change in the way

and manner in which students behave through organized body of knowledge. Curriculum is all the experiences children have under the guidance of teachers. In line with the above.

The Federal Ministry of Education (2019) on the objectives of Junior Secondary Education. Integrated Science curriculum stated that students among other things are to:

i. develop interest in the subject of Integrated Science

ii. acquire basic theoretical and practical knowledge and skills.

iii. develop interest in STM.

iv. acquire basic STM knowledge and skills

v. develop reasonable level of competence in ICT application that will engender entrepreneurial skills.

vi. apply skills to meet societal needs of creating employment and wealth.

vii. be positioned to take advantage of the numerous career opportunities offered by Integrated Science.

The aims of the Integrated Science curriculum for secondary school are to provide students with the knowledge and skills in Integrated Science and technology and enable them to solve problems and make decisions in everyday life based on scientific attitudes and noble values. Students who have followed the Integrated Science curriculum will have a basic foundation in Integrated Science to enable them to pursue formal and informal further education in science and technology (Offorma, 2017).

The curriculum also aims to develop a dynamic and progressive society with a science and technology culture that values nature and works towards the preservation and conservation of the environment.

The Integrated Science curriculum for secondary school enables students to:

1. Acquire knowledge in Integrated Science and technology in the context of natural phenomena and everyday life experiences and understand developments in the field of Integrated Science and technology.
2. Acquire scientific and thinking skills, apply knowledge and skills in a creative and critical manner to solve problems and make decisions.
3. Face challenges in the scientific and technological world and be willing to contribute towards the development of science and technology.
4. Evaluate science and technology related information wisely and effectively.
5. Practise and internalise scientific attitudes and good moral values.

The Integrated Science curriculum is organised by topics. Each topic consists of various teaching areas, each of which consists of a number of teaching objectives. A teaching objective has one or more teaching outcomes. Teaching outcomes are written based on the hierarchy of the cognitive and affective domains. Levels in the cognitive domain are: knowledge, understanding, application, analysis, synthesis and evaluation. Levels in the effective domain are: to be aware of, to be in awe, to be appreciative, to be thankful, to love, to practise, and to internalize (Ali, 2020).

Where possible, teaching outcomes relating to the affective domain are explicitly stated. The inculcation of scientific attitudes and noble values should be integrated into every teaching activity. This ensures a more spontaneous and natural inculcation of attitudes and values. Teaching outcomes in the psychomotor domain are achieved implicitly through the teaching activities. The Suggested Teaching Activities in the

supporting document entitled 'Curriculum Specifications' provides information on the scope and dimension of teaching outcomes. The suggested teaching activities aim at providing some guidance as to how teaching outcomes can be achieved. At the same time, more than one activity may be suggested for a particular teaching outcome. Teachers may modify the suggested activities to suit the ability and style of teaching of their students. At the same time, teachers are encouraged to design other innovative and effective teaching activities to enhance the teaching of science.

Students should be made aware of the thinking skills and thinking strategies that they use in their teaching. They should be challenged with higher order questions and problems and be required to solve problems utilising their creativity and critical thinking. The teaching processes should enable students to acquire knowledge, master skills and develop scientific attitudes and noble values in an integrated manner.

The teaching of science is not limited to activities carried out in the school compound. The latest trend in science education is to encourage smart partnership between the Ministry of Education and various organisations such as institutions of higher teaching, other governmental agencies, non-governmental agencies and private corporations to provide new ideas, opportunities, strategies and skills. Teaching of science can also be enhanced through the use of external resources such as zoos, animal sanctuaries, museums, science centres, research institutes, mangrove swamps, and factories. Visits to the these places make the teaching of science more interesting, meaningful and effective. To optimize teaching opportunities, visits need to be carefully planned. Students may be

involved in the planning process and specific educational tasks should be assigned during the visit. No educational visit is complete without a post-visit discussion.

Empirical study on Information and Communication Technology on impact Integrated Science teaching

Betiku (2017) defined Information Technology as any equipment or technique used by people to handle information". While Hassan (2022) defined information technology as a broad based technology that supports the creation, storage and manipulation of information. Betiku (2017) has argued that sometimes, it is called Information and Communication Technology (ICT) as the activities of information technology involve communication (ie the process of sending and receiving message). NTI (2022) simply defined ICT as a means of receiving, processing, storing, retrieving and dissemination of information through the use of Computer and other telecommunication. From the above definitions, information and communication technology (ICT) can be defined as the application of computer and other telecommunication gadgets to store, retrieve, transmit and manipulate data in any human endeavour.

Hassan (2022) view information and communication technology (ICT) as information handling tools that are capable of being used to generate process, store and retrieve, distribute and exchange information. When these different tools work together, they combine to form a network which reaches any part of the globe. It has increasingly become the most powerful tool for participating in virtually every global activity such as global market, promoting political accountability, improving the delivery of basic services and enhancing local development opportunities (UNDP 2020).

Observation of the researchers during teaching practice supervision has shown that very many of these listed ICT resources if not all were not available in the secondary schools. It is worthy of note that the propensity to use ICTs in teaching activities is highly determined by the availability of these resources in the schools.

In a study that explored factors that influence classroom use of ICT in Sub - Saharan Africa (Hennessey, 2020), cited in Kiptalam and Rodriguess, (2022) reveal that the integration of technology into education is highly dependent on the availability and accessibility of the resources in schools. The case of secondary schools in Ardokola and Jalingo may not be different.

Ozorehe (2018) observed the "utilization of ICT in the teaching of Integrated Science in secondary schools in Osun State". The target population was two hundred and thirty one (231) secondary schools out of which fifteen (15) secondary schools were selected as the sample by simple randomization. Five (5) null hypotheses were stated which were tested using correlation coefficient test statistics at 0.68 level of significance, and all the five (5) null hypotheses were rejected. The result showed that about 60% of the respondents made use of the teaching aids effectively which had positive relationship in the teaching of Integrated Science in secondary schools in Osun State.

Oyedun (2020) observed the effects of Instructional Materials on Students' Performance in Geography in selected Secondary Schools in Ilorin Ilorin Metropolis Kwara State. The target population was fourteen (14) secondary schools out of which eight (8) secondary schools were selected as the sample by simple random sampling. Three (3) null hypotheses were stated which were tested using correlation coefficient test statistics at

0.8 level of significance, and all the three (3) null hypotheses were accepted. The results showed that about 80% of the respondents did not make use of the instructional materials appropriately which had negative effects on the performance of students in Integrated Science in Secondary Schools in Ilorin Metropolis Kwara State.

Influence of ICT tool and in teaching in schools

Adeyegbe and Ayo (2017) identified the ICT gadgets and as radio, television, compact discs, satellites, e-mail, internet, overhead projector, micro projector, video machines, computers, camera, etc. Achimugu (2015) expatiating on this list, included telephone, Global System for Mobile Communication (GSM), facsimile (fax) and telex machine. Contributing to this, Ugwu, (2019) identified the following additional : electronic bulletin Board, teleconferencing, teleprocessing, database, internet optical fibre, white board, etc. The researcher concludes that these selected IT gadgets/ facilitate effective teaching when use appropriately for teaching Integrated Science.

Radio is wireless electronic device that transmits audio signals from radio station and are picked up by any radio bands such as frequency modulation (FM), short wave (SW) and amplitude modulation (am) bands. Radio can be used to teach Integrated Science by placing it in the special listening classrooms. Tape Recorder is a modern machine that records the voices of people. There are many models of radio cassette recorders that are now available. They can be used in various ways in teaching Integrated Science. They can be used for playing a pre-recorded cassette for instance, during a field trip, they can also record radio broadcast. For instance on quizzes which can be used for the students – teachers interaction (Asiegbu, 2015).

Television is an audio visual medium and popular electronic mass media of instruction. Television can be used in teaching Integrated Science by watching television programmes like quizzes, puzzles, games, debates, etc, in relation to Integrated Science as a subject. Video Machine: This is a type of machine that is used to project motion picture and the pictures are fashioned for continuous projection at a particular speed. There are different types such as video tape machine, digital video discs (DVD), video compact discs (VCD), etc. It can be recorded in tape or disks. Video is a good IT facility that can be used for teaching Integrated Science. For instance, one can use slim video tools which contains video lecture, video – simulation, interactive simulation, task review, etc to effectively teach Integrated Science.

Digital Camera is also used to capture picture and it can be used to teach Integrated Science most especially during Integrated Science educational tours such as field trip. Pictures snapped during a field trip or excursion can be reported back to other students who were unable to attend the field trip or excursion (Eze, 2018).

Projector is a device that allows images to be focused on the screen. It can be overhead projector, micro projector, film projector, etc. A Integrated Science teacher can prepare his or her own slide on different topics or can buy commercially prepared slides and systematically use the slides in teaching the students using any of the available projectors. Telephone: This is a telecommunication device that is used to send and receive audio (sound) signals across distances. Telephones can be used to ask presenters questions for better understanding of Integrated Science concepts during a television or radio programmes (Eze, 2018).

Global System for mobile communication (GSM) is a modern portable telephone that connects to a cellular based station used for personal communication over short or long distance. Apart from the traditional role of sending and receiving calls, it has advantages over telephone as it provides other services such as text messages (SMS), E-mail, internet and SMS facility for sending and receiving photos and videos. It can be used to teach Integrated Science in many ways. Computer: This is a modern machine that can be programmed to automatically perform various operations. Information can be created, stored and transmitted through the computer. Computer can be put to use in various ways in teaching Integrated Science. For instance, information accessed through browsing such as lesson notes, data, diagrams, images, animation, etc (Eze, 2018).

Internet is a global collection of computers linked to each other, sharing available resources and communicating effectively. Internet connectivity provides audio and video information which facilitates Integrated Science classroom lessons. For instance, Integrated Science class teaching, individualized instruction, etc can be downloaded through internet browsing, which can be printed out or saved on computer or copied to CD for later usage in presenting a given topic in an interesting way to the students. E– Mail Address also known as electronic mail is a means of carrying out a computer based communication in which an electronic letter is sent to one or more recipients via the help of the internet. This also can be used in teaching Integrated Science in different ways. For instance, through social network and online charts, Integrated Science teachers can reach and interact with their students in teaching which can help to remove the abstractness of some concepts (Eze, 2018).

World Wide Web (www) is a medium that allow people to get information which is available on the internet. Lesson notes can be downloaded from web sites and used in teaching Integrated Science effectively. Example of such sites is http//www.teachnet.com

Concept of the Need for ICT Integration in Teaching in secondary Schools

An ICT driven teaching environment is important factor in Nigeria educational sector as it support qualitative teaching process. Over the years what dominated the classroom in Nigeria was principally the chalkboard and textbooks. Although radio/television and film have been used for educational purposes in many countries of the world, they have not been common features in the Nigerian classroom. In the areas where they were used, none has impacted on the educational process as the computer. While television and films appeal to the audio-visual faculties of users, the computer is capable of activating the sense of sight, hearing and touch of the user. It has the capacity to provide higher interactive potentials for users to develop their individual intellectual and creative ability. According to Shavinina (2019) the crux of ICT consists just in the development of human mental resources which allow people to both successfully apply the existing knowledge and produce new knowledge.

Contributing to this, Eze (2018) noted that education in whatever form it takes is not complete without effective use of ICT and that the significance of ICT in education includes: access to variety of teaching resources, immediacy of information, anytime anywhere teaching, collaborative teaching, multimedia approach to education, authentic and up to date information, access to online libraries, distance teaching, individualization of instruction, reduce time on many routine task, access to the source of information,

teaching science subjects made interesting, etc. Agommuoh (2015) further observed that the use of ICT in teaching science subjects will make teaching more real, relevant and experimental as large amount of data and materials on any topic can be brought to the classroom from all over the world thereby, greatly facilitating the acquisition and absorption of knowledge and offering students unprecedented opportunities to enhance their teaching. From the foregoing, ICT is rapidly transforming the world into a global village and Integrated Science education is one of one of the beneficiaries of this global revolution in teaching process using ICT. In line with competitiveness and emphasise of the use of ICT in teaching and teaching, government of various levels and non-governmental organisations i.e. *old boys Association* have continued to intensify efforts to supply ICT to Junior secondary schools in Nigeria. But evidence in literature tends to show that the available ICT in our schools are underutilized. (Ojaleye 2019, Ugwu 2019, and Okoye 2017). In the same vein, Nwagbo and Ugwanyi (2018) have argued that despite aforementioned impact of ICT in teaching science, effective utilization of it is being impeded by some challenges like lack of confidence, resistance to change, negative attitudes, lack of technical support, insufficiency in the school timetable, etc.

Factors Affecting the Utilization of ICT in Teaching of Integrated Science

In many ICT teaching projects, according to Ndume (2018), students face some challenges of bad perception during their studies: Lack of Pedagogy in the content developed, lack of resources, lack of user's touch and feeling in their platform. At home, more ICT learners may not manage to study as they are responsible for domestic activities (like caring for children and solving some household chores). Furthermore, some

instructors may not be knowledgeable enough in coaching or use of multimedia tools if they lack telecoaching skill. Contributing to this, Gunge (2020) added that while the urge to embark on ICT is high in Nigeria, it is still a dream because of weak ICT infrastructure, unsensitized populace and technophobia workforce. Gunge further identified high cost of personal computer, laptop, software, internet and the technical support, and power instability, blackout in towns and un-connectedness in rural areas, as problems that militate against utilization of ICT tools for effective delivery of instruction in Nigerian Universities.

The wide gap between the experience of ICT experts who develop ICT system and the slow, and sometimes, unwilling designers of education instructional system planner is also a challenge (Ilechukwu, 2022). Davis (2022) identified limited access to computer and modems as factors that is detrimental to the success of ICT environment. High cost that must be met by the learners which arises from connecting to internet as a challenge. Connecting to internet might be unreliable, slow or limited and might cause frustration and failure of outcome, materials cannot be accessed and downloaded in time to support efficient . McClelland (2019) maintained that "electronic_ content cannot currently sustain the qualities and multi dimensionality of the kind of tutor-student relationship that with ICT seems to require.

Influence of Teacher Gender on Academic Performance of Students in Integrated Science

Gender is a major factor that influences career choice and subject interest of students. Further explanation in this context shows that Home Economics, Nursing,

Secretary-ship and other feminine related careers have been traditionally regarded as aspects of the school curriculum reserved for females (Umoh, 2019). Based on this, males chose male stereotyped occupations and females chose female stereotyped occupations.

According to Umoh (2019) more difficult tasks are usually reserved for males while less difficult ones are considered feminine in a natural setting. Example of this is breaking of firewood, which is often seen as manly task while washing of plates could be seen as a female task at home. Thus at school males are more likely to take to difficult subject areas and challenging problem-solving situations while female on the other hand prefer simple subjects and often shy away from difficult tasks and problem-solving situation.

Ekeh (2019) discovered that male secondary school students performed better than females in science and mathematics. These differences in performance can be attributed to gender stereotyping which encourages male and female students to show interest in subjects relevant and related to the roles expected of them in the society. The National Assessment of educational Progress in 1992 showed that males had higher average scores than girls between the ages of 9, 13 and 17. Studies have shown that co-education has negative impact on cognitive performance of students as girls perform better without the boys and vice versa (Okon, 2019). She also stated that the association formed between genders as it applies to co-educational institution causes psychological inferiority complex and this hinders effective classroom participation. Furthermore, it is a known fact that attitude developed by young people during their study of science can be as important as the skills they acquire and the knowledge they obtain. This is because attitude regulates

behaviour not only in the classroom but in all other areas of human experience. Concluding, Okon (2017) maintains that gender has no significant influence on students' performance in science.

Influence of Teachers' Qualification on Teaching of Integrated Science

The quality of education of a nation could be determined by the quality of the teachers. The most important factor in improving students' achievement in Integrated Science is by employing seasoned qualified teachers in all schools (Abey and Adu 2019), Olorunwa (1999) found that, policy investment on quality of leaders related to improvement in students performance. Specifically, the measurement of teacher's preparation and certification are correlates of students' achievement in Integrated Science. It is further reported that, teachers characteristics such as certification status and degree in area of specialization are very significant and positivity correlated with students out comes in Integrated Science.

Academically qualified teachers refers to those who have academic trauma as a result of enrolment into educational institution and obtained qualification such as HND, B.Sc.BA and MA, and so on, while professionally qualified teachers are those who got professional training that gave them professional knowledge skills, techniques aptitudes as afferent from the general education (Edu and Kalu 2018). They hold degrees, B.Sc.Ed, BA.Ed, and M.Ed and so on. On the other hand there are studies that found no significant relationship between teacher qualification and students academic achievement.

Coonery (2000) opined that students do not understand Integrated Science when taught by an ineffective teacher. Kumi and Evess (2019) buttressed this by saying that teacher quality is the most important among other critical factors like quality curriculum finding, small class size situation. George (2017) attributed poor achievement of students in economic to teacher qualification, inadequacy of materials as well as administrative factors. In view of this a teacher is someone who as be exposed to a good measure of training in a teaching subject area as well as in professional education such professionally qualified teachers may according to the federal ministry of education (2017) fall into a number of academic categories. Moka (2017) regarded the trained teacher as someone who underwent and completed his education in a formal teacher training institution or in a planned program of training and such teacher could contribute significantly to the access of his/her teaching- encounter.

Turrugia (2017) professional teacher as one who possesses professional based knowledge in the theory and practice of education as well as find job satisfaction in the belief that he/she is making an important contribution to the social–cultural and economic development of his/her country. Such a teacher should equally be able to understand students' abilities to exploit educational benefits of the social context within which he/she lives full intellectual and social potentials.

Teachers' qualification however was view by salami (2017) as an important invoices which determine the teachers potential his/her instructional design and methodologies, reflectivity in teaching, knowledge skills in pedagogical ,teaching as well as the extent to which instructional materials were perfectly integrated into his/her

teaching. Therefore it could by conclude that teacher's qualification plays significant correlation on students potential and the eventual performance in secondary schools in Integrated Science most especially at Junior secondary school level (Lawal 2018).

Influence of Years of Teaching Experience on Integrated Science Teaching

With regard to teaching experience, it is important to bear in mind that some research has suggested that the positive effects of teaching experience in relation to students' achievement are not constantly additive, but instead tend to level off after 4 few years (Rivkin, & Kain, 2018). Greenwald and Lame (2022) have demonstrated a significant and positive relationship between teachers' number of years of experience and student achievement. However, these authors argue that the relationship is not linear. It is important to balance these studies on teacher experience with the finding that teachers' effectiveness in improving student achievement appears to increase most in the first three years of teaching, but no major improvement in their effectiveness has been served after three years of teaching experience (Grossman, Lankford, & Kain, 2018).

Appraisal of the Reviewed Literature

In the review, the types of information and communication technology were identified and these included Radio, tape recorder, television, video machine, digital camera, projector, telephone, global system for mobile communication (gsm), computer, internet, e–mail address, world wide web (www), satellite, electronic bulletin board as they could influence the quality of instructional design in Integrated Science, this also enhance productive teaching at Junior secondary school level. The chapter also discusses the contents and objectives of Junior secondary school Integrated Science curriculum as

identified by the Federal Ministry of Education (2019); develop interest in the subject of Integrated Science, acquire basic theoretical and practical knowledge and skills, develop interest in science etc. Also, the importance and uses of information and communication technology in our educational setting were treated. This is because, they are of prime importance to both dull and bright students as they aid by aiding the sense of seeing, hearing etc., making lesson more interesting, directing teaching to its goals, arousing students interest and motivating them to learn and develop the sense of imagination and comparison.

In a global economy that is ICT-driven where almost every human activity is computer based, application for jobs, admissions, checking of results, buying and selling and even banking are now done online, the Nigerian student should be acquainted with ICTs to enable him cope in the society after school. Apple Computer (2019) states that students who use ICTs gain deeper understanding of complex topics and concepts and are more likely to recall information and use it to solve problems outside the classroom.

The use of information and communication technology is important in teaching. Effective teaching cannot take place without adequate preparation and use of information and communication technology, such provided should be relevant, adequate and to the ability levels of the students. Since what students see physically can easily be assimilated and remembered when required. It also offers a variety of experiences which stimulate self activity with the overall effect of making to be more indispensable. Where these materials are scarce, teachers should be left to improvise, innovate and invent and clue regard should

be given to accuracy the greater the accuracy in the design, the clearer the mental impression created on the learners.

CHAPTER THREE

RESEARCH METHODS

This chapter presents the methodology adopted in carrying out this research work. It has been discussed under the following subheadings:

Research Design,

Population

Sampling and Sampling Techniques,

Research Instrument,

Validity of Instrument,

Reliability of the Instrument,

Procedure for Data Collection

Data Analysis Techniques.

Research Design

Descriptive survey method will be adopted for the study. A descriptive research describes systematically a situation or an area of interest factually and accurately. Hence, this study intends to conduct a survey study on the impact of ICT in teaching Integrated Science in Junior secondary school in Ilorin Metropolis , Kwara State.

Population

The target population for this study comprised all secondary schools teachers in Ilorin Metropolis, Kwara State.

Sample and Sampling Techniques

The sample size of the teachers is thirty (30), with three (3) teachers in both public and private Secondary School in Ilorin Metropolis Kwara State. Five (5) public and five (5) private secondary schools would be randomly selected for the study. Three (3) Integrated Science teachers would be randomly selected from each of the sampled schools. Thus, thirty (30) teachers would be the sample for the study.

Research Instrument

The instrument used for this study was a questionnaire entitled: " impact of ICT in Teaching Integrated Science Junior Secondary School Questionnaire (IICTTISJSSQ)", which was prepared by the researcher and administered on the teachers that participated in the study. The questionnaire contained two sections, section A contains information on teacher's personal data; while the section B would focus on questions relating to teachers level of utilization and availability of ICT tools. Each teacher would be expected to respond to the item by ticking as appropriate from the options provided. Similarly a questionnaire would be design to determine the level of availability.

Validity of Instrument

The research instrument will be validated by the researcher's supervisor. The supervisor help the researcher to establish the face and content validity of the instrument.

The suggestions and corrections made were utilized to enhance the instrument before the reliability test was carried out. The instrument was then administered.

Reliability of the instrument

To determine the reliability of the instruments, the questionnaire will be subjected to test-retest method. The instrument was administered to Thirty (30) teachers who was not part of final administration. The instrument will be re-administered on the same subject after three weeks interval.

Procedure for Data Collection

The researcher will visit the selected schools and seek for the permission from the school Principals or Vice-Principals of the selected schools as well as Head of Department of Integrated Science. The cooperation of the Integrated Science teachers will be sought in the course of administration of the questionnaire. Thereafter the questionnaire will be administered and collected back after it is filled and completed.

Data Analysis Techniques

The data collected will be statistically analyze using percentage, while the hypothesis was subjected to inferential statistics of chi-square statistical tool at 0.05 level of significance.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the results and discussion of findings on the impact information communication technology in teaching of Integrated Science in secondary school. The results is presented in tabular format and discussed under it.

Data Analysis

Demographical Distribution of Respondents

Table 1: Gender Distribution of Respondents

Gender	Frequency	Percentage
Male	13	43.3%
Female	17	56.7%
Total	**30**	**100%**

Source: Field survey, 2025.

Table 1 above shows that 43.3% of the Integrated Science teachers selected in this study were male while 56.7% are female in the selected secondary schools in Ilorin West, Kwara State.

Table 2: Qualification of Respondents

Qualification	Frequency	Percentage
B.ED/SC	12	40%
M.ED/SC	15	50%
HND/PGDE	2	7%
NCE/ND	1	3%
PH.D.	0	-
Total	**30**	**100%**

Source: Field survey, 2025.

Table 2 shows that 40% of the Integrated Science teachers are with B.ED/SC qualification follow with teachers with M.ED/SC qualification having 50% respectively while 7% others had HND/PGDE while 3% of teacher had NCE or ND qualification . The results above implies that majority of the teachers are with M.ED/SC qualification. Which concludes that all the Integrated Science teachers are qualified.

Table 3: Respondents Years of Experience

Years of Experience	Frequency	Percentage
0 - 5 years	18	60%
6 years and above	12	40%
Total	**30**	**100%**

Source: Field Survey, 2025.

The table above shows that 60% of the teachers had an experience up to 0 – 5 years will the other 40% teachers had been in service for 5 years and above .

Table 4: Distribution of Schools

School	Frequency	Percentage
Public School	5	50%
Private School	5	50%

Total	**10**	**100%**

Source: Field Survey, 2025.

Table 4 above shows that 5 public schools were selected in the study and 5 private schools were also selected for the study. The total population of school selected was 10.

Presentation of Results

Research Question One: What Level Does the Impact of Information Communication Technology for Teaching of Integrated Science in Ilorin Metropolis Kwara State?
Table 5:

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)
1.	My school have necessary infrastructure (computer, internet access, e.t.c) to use ICT for teaching Integrated Science?	10 (33%)	5 (17%)	5 (17%)	10 (33%)
2.	My school have a dedicated space (computer lab) for using ICT resources for teaching Integrated Science?	15 (50%)	7 (23%)	3 (10%)	5 (17%)
3.	My school have access to a variety of ICT resources (online textbook, simulator, virtual tabs, e.t.c) for teaching Integrated Science?	15 (50%)	5 (17%)	5 (17%)	5 (17%)
4.	I am provided with the necessary training and support to use ICT resources for teaching Integrated Science??	5 (17%)	10 (33%)	10 (33%)	5 (17%)
5.	I agree that your school has policies and procedures in place for using ICT resources for teaching Integrated Science?	5 (17%)	10 (33%)	5 (17%)	10 (33%)

Source: Field Survey, 2025.

Table 5 above shows the responses of the teacher. Based on the result above, 50% agree that teacher's attitude influence students academic performance in Integrated Science while 50% of the respondent disagree.50% teachers agree that there school have a dedicated space for using ICT resources for teaching Integrated Science while 50% of the teachers disagree. 67% of the respondent also agree that there school also have access to a

variety of ICT resources for teaching Integrated Science while 32% disagree.50% of the teachers agrees that they are provided with necessary training and support to use ICT resources for teaching Integrated Science 50% disagree finally 50% of the respondent agree that there school have policies and procedures in place for using ICT resources for teaching Integrated Science while 50% of the respondent disagree

Research Question Two: Does the Level of Available and Utilization of Information and Communication Technology in Teaching of Integrated Science at Junior Secondary School in Ilorin Metropolis Have any Influence on the Teachers' Gender?

Table 6: Influence On The Teachers Gender

S/N	ITEMS	SA (%)	A (%)	SD (%)	D (%)
6.	Both male and female Integrated Science teachers have equal access to ICT resources?	13 (43%)	19 (33%)	6 (20%)	1 (4%)
7.	Male and female Integrated Science teachers have equal access to ICT resources?	4 (13%)	11 (37%)	11 (37%)	4 (13%)
8.	There are differences in the benefit and challenges of using ICT between male and female?	6 (20%)	12 (40%)	8 (27)	4 (13)
9.	there are any differences in the recommendations for improving ICT used base on gender?	3 (10%)	8 (27%)	14 (46%)	5 (17%)

Source: Field Survey, 2025.

Table 6 revealed that 76% of the respondents generally agreed that male and female Integrated Science teachers have equal access to ICT resources. while 24% disagreed. 50% generally agreed that they disagree that male and female teachers have equal access to ICT resources. while 50% disagreed. Also, 60% of the respondents agreed that male and female teachers use ICT resources differently while 40% disagreed. 37% of the respondent also

agree that there are differences in the benefits and challenges of using ICT between male and female teachers while 63% of the respondent disagreed. Lastly, it was revealed that not all the respondents agreed that there are differences in the recommendation for improving ICT use based on gender, 23%agreed wile the remaining 67% disagreed.

Research Question Three: Does the level of available and utilization of information and communication technology in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis have influence on teachers academic qualification?

Table 7: Influence Of Teachers Academic Qualification

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)
10.	ICT resources are more beneficial for teachers' with higher academic qualification?	12 (40%)	13 (43%)	3 (10%)	2 (6%)
11.	Teachers with different academic backgrounds perceive ICT resources differently?	4 (13%)	18 (60%)	6 (20%)	2 (7%)
12.	The level of academic qualification influence the frequency of ICT use in Integrated Science lesson?	5 (16%)	14 (46%)	11 (37%)	-
13.	ICT resources are more useful for teachers with more experience?	6 (29%)	6 (20%)	14 (47%)	4 (13%)
14.	teachers with more experience use ICT resources more effectively?	10 (33%)	13 (43%)	5 (17%)	2 (7%)

Source: Field Survey, 2025.

Table 7 above shows the responses of the teacher based on academic qualifications . Based on the result above, 83% of the teachers generally agreed thatteachers qualification have an influence on students academic performance in Integrated Science while 17% disagreed. 73% generally agreed that teachers with different academic backgrounds perceive ICT resources differently while 27% disagreed. 63% agreed that the

level of academic qualifications influence the frequency of ICT use in Integrated Science lesson while 37% disagreed. Further more, 40% agreed that there should be a disagreement on the fact that ICT resources are more beneficial for teachers with higher academic qualification while 60%disagreed. Also, 76% generally agreed that ICT resources are more useful for teachers with more experience while 24% disagreed.

Research Question Four: Does The Level Of Available And Utilization Of Information And Communication Technology In Teaching Of Integrated Science In Ilorin Metropolis Have Any Influence On Teachers Year Of Teaching Experience?

Table 8: Influence On teachers year of teaching experience.

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)
15.	Teaching experience affect the attitude toward ICT in Integrated Science lesson?	9 (30%)	15 (50%)	5 (17%)	1 (3%)
16.	Teachers with more teaching experience are more likely to use ICT resources?	6 (20%)	16 (53%)	5 (17%)	3 (10%)
17.	teachers with more teaching experience likely to use ICT resources?	20 (67%)	3 (10%)	7 (23%)	-
18.	Do teachers with more teaching experience find ICT resources more useful?	2 (7%)	24 (80%)	4 (13%)	-

Source: Field Survey, 2025.

Table 8 above shows the responses of the teacher to know the influence on teachers year of teaching experience. Based on the result above, 80% agreed that teachers with more experience use ICT resources more effectively while 20% disagreed. 73% of the respondents generally agreed that teaching experience affect the attitude toward ICT in Integrated Science lesson. while 27% disagreed. 77% generally strongly agreed that teachers with more teaching experience are more likely to use ICT resources while 23% disagreed. Further, 87% generally agreed that teachers with more teaching experience are

likely to use ICT resources more while 1 13% disagreed. Lastly, 93% of the respondent agreed that teachers with more teaching experience find ICT resources more useful than teachers with less experience while 7% of the respondent disagree to that.

Testing of Hypotheses

Hypothesis One: There is no significant relationship between impact information and communication technology based on effective teaching of Integrated Science at Junior secondary school in Ilorin Metropolis Kwara State.

Table 9: Chi-square analysis showing the result of hypothesis one.

N	***Df***	***X^2 Cal.***	***X^2 Crit.***	***P-value***	***Remark***
30	12	37.2	21.02	0.05	$H0_1$rejected

Table 9 above shows the outcome of the chi-square result, the result shows that the calculated x^2 value is greater than the x^2 critical value of 21.02 at 0.05 significance. there for the null hypothesis which stated that there is no significant relationship between impact information and communication technology based on effective teaching of Integrated Science.

Hypothesis Two: There is no significant difference between the impact information and communication technology based on the teachers gender in teaching of Integrated Science at Junior secondary schools in Ilorin Ilorin Metropolis Kwara State.

Table 10: Chi-square analysis showing the influence on teachers gender.

N	***Df***	***X^2 Cal.***	***X^2 Crit.***	***P-value***	***Remark***
30	12	29.6	21.02	0.05	$H0_2$rejected

Table 10 reveals that the calculated X^2 value of 29.6 is greater than the critical X^2 value of 21.02 at 0.05 significance .There for the null hypothesis above stated that There is no significant difference between the impact information and communication technology based on the teachers gender in teaching of Integrated Science at Junior secondary schools there by the hypothesis is rejected **.**

Hypothesis Three: There is no significant difference between the impact information and communication technology based on the teacher academic qualification in teaching of Integrated Science at Junior secondary schools in Ilorin Ilorin Metropolis Kwara State.

Table 11: Chi-square analysis showing the influence on teachers academic qualifications

N	***Df***	***X^2 Cal.***	***X^2 Crit.***	***P-value***	***Remark***
30	12	27.7	21.02	0.05	$H0_3$rejected

Table 11 above reveals that the calculated X^2 value 27.7 is greater than the critical X^2 value of 21.02 at 0.05 level of significance .There for the null hypothesis above is rejected.

Hypothesis Four: There is no significant difference between the impact information and communication technology based on the teacher years of teaching experience in teaching of Integrated Science at Junior secondary school in Ilorin Ilorin Metropolis Kwara State.

Table 12:chi-square analysis on influence on teachers year of teaching experience.

N	***Df***	***X^2 Cal.***	***X^2 Crit.***	***P-value***	***Remark***
30	12	47.1	21.02	0.05	$H0_{4\ \text{rejected}}$

Table 12 above reveals that the calculated X^2 value 47.1 is greater than the critical value X^2 value of 21.02 at 0.05 level of significance there for the null hypothesis above is rejected

Summary of Findings

The study revealed that:

- There is a significant relationship between the availability of information communication and technology and effective teaching of Integrated Science at Junior secondary school in Ilorin Metropolis , Kwara State.
- There is a significant relationship between teacher's gender and the level of utilization of information and communication technology in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis , Kwara State.
- There is a significant relationship between teachers qualification and the level of utilization of information and communication technology in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis , Kwara State.
- There is a significant relationship between teachers years of experience and the level of utilization of information and communication technology in teaching of Integrated Science at Junior secondary schools in Ilorin Metropolis , Kwara State.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the discussion of the findings, the conclusion, recommendations based on the findings from the study, limitations of the study and suggestions for further studies.

Discussion

The study discovered the impact of ICT tools in teaching Integrated Science among the Junior secondary school teachers in Ilorin Metropolis, Kwara Sate. The result obtained reveals that majority of the ICT tools for teaching in the secondary schools are not available and the few available ones are under-utilized by the teachers.

The findings from the analysis revealed that majority of ICT tools are not available in most of the schools is in conformity with the findings of Ahmed, Abimbola, Omosewo and Akanbi (2018) who find out that most of the ICT tools are not available in school for teaching in Kwara State. It is also in line with the finding of Betiku (2017) who points out that telephone, satellite, E–mail, Internet and www are not available in the schools in reasonable numbers. Another interesting finding analyses was that GSM and computers are found in most schools. This may be as a result of Integrated Science teachers having personal GSM and laptop computers.

The finding from the analysis shows that the few available ICT tools are underutilized, is in agreement with the findings of Ndirika and Kanu (2018) who separately reported that the extent of science teachers' utilization of ICT infrastructure is

low in Abia States. Also, this work collaborates with the findings of Igboegwu, Egolum and Nnoli (2022) who found out, that most junior secondary school Integrated Science teachers in Anambra State were not using ICT for their teaching Integrated Science. Also the finding from analysis indicates that GSM and computers were seldomly used, even though they are available in the schools.

The results from the analysis also revealed that despite the sensitization given on the vital role of ICT in enhancing, the teaching of Integrated Science, most of the secondary schools do not have the ICT and that the Integrated Science teachers do not properly utilize them in teaching Integrated Science. Indeed the finding of this study contradicts the tenets of the policy document and therefore has placed the success of the policy document in jeopardy as concluded from the finding of Salawu and Ajayi (2018). Therefore the provision of adequate ICT and the proper utilization by Integrated Science teachers in teaching of Integrated Science is very important.

Conclusions

This study has revealed that ICT tools are not available in reasonable number in majority of the sampled in Ilorin Metropolis , Kwara State schools and that the available ones are not being utilized properly by Integrated Science teachers, despite the impact of ICT infrastructure on Integrated Science education. The study however, concludes that information and communication technology were not readily available in most of the

sampled schools and the available ones were not utilized effectively to enhance teaching of Integrated Science.

Also, teachers gender, academic qualification and years of teaching experience influence the level of utilization of available information and communication technology in teaching Integrated Science.

Implications of the Study

The findings of this research could have implications both for understanding teachers' perceptions and attitudes towards the impact Information and communication technology facilities in teaching process, the different aspects, roles, tasks and components of their profession and for supporting teachers to develop positive perceptions and attitudes of their profession. This fact could be a starting point to develop and implement of strategic actions focused on how teachers can be more engaged and retained in their job, and can be implied to participate to their continuous professional development to become more efficient, competent and professional teachers.

Recommendations

On the basis of the findings of this study, the following recommendations are put forward:

1. Government at various levels should ensure adequate provision of Information Communication and Technology (ICT) tools in the Junior secondary schools and indeed, at the other levels of education to support teaching and .
2. Integrated Science teacher should be trained accordingly on the handling procedure and efficient utilization of available ICT tools to complement Integrated Science

teaching. Integrated Science teachers should be more committed to their teaching job by utilizing the available ICT tools/ in teaching Integrated Science appropriately.

3. Integrated Science teachers should endeavour to attend seminars, conferences and workshops to equip themselves to face global challenges of effectively using information technology tools and in teaching Integrated Science.
4. Integrated Science teachers should be well motivated and encourage to use ICT tools in their teaching.

Limitations of the Study

The study examined the impact ICT in teaching Integrated Science in Junior secondary school in Ilorin Metropolis, Kwara State. As a result of inadequate time and finance, the study was limited to thirty (30) teachers selected randomly across both public and private secondary schools in Ilorin Metropolis , Kwara State.

Suggestions for Further Studies

The study investigated into impact ICT in teaching of Integrated Science in Junior secondary school in Ilorin Metropolis, Kwara State. However, further studies can be carried out on the following areas.

1. Factors affecting teachers' effectiveness in ICT integration instructional design in teaching of Integrated Science in secondary schools in Ilorin Metropolis , Kwara State.

2. Relationship between teachers' qualification and students performance in Integrated Science in Ilorin Metropolis , Kwara State.
3. The imperative role of ICT in teaching of Integrated Science in selected secondary schools in Ilorin Metropolis, Kwara State.

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QUESTIONNAIRE

IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TEACHING OF INTEGRATED SCIENCE IN SECONDARY SCHOOLS IN ILORIN METROPOLIS

Dear respondent,

This questionnaire is designed to elicit responses from Junior secondary school Integrated Science teacher based on the above title. Kindly tick the options that represent your opinion most closely. Be assured that the information given will be treated with utmost confidentiality.

Thanks for your anticipated cooperation.

Alade Abibat

Yours faithfully

SECTION A: DEMOGRAPHY

Please kindly tick (√) the correct option as relevant to you

Gender: (a) Male ( ) (b) Female ( )

Academic Qualification. B.Ed/Sc ( ), M.Ed/Sc ( ), HND/PGDE, ( ) (NCE/ND) ( ) Ph.D ( ).

Year of Teaching Experience: (a) 0-5 years ( ). (b) 6 years and above ( )

Section B

Respondents are hereby reqested to the following questionnaires in this section through the use of four likert scale strongly Agree (SA) Agree (A) Strongly Disagree (SD) Disagree (D)

S/N	QUESTION	SA	A	SD	D
A	**what level does impact information and communication technology for teaching integrated science in junior secondary schools in ilorin metropolis l.g.a. kwara state?**				
1	My school have the necessary infrastructure (computers, internet access, etc.) to use ICT for teaching Integrated Science?				
2	My school have a dedicated space (such as a computer lab) for using ICT resources for teaching Integrated Science?				
3	My school have access to a variety of ICT resources (such as online textbooks, simulations, virtual labs, etc.) for teaching Integrated Science?				
4	I am provided with the necessary training and support to use ICT resources for teaching Integrated Science?				
5	I agree that my school has policies and procedures in place for using ICT resources for teaching Integrated Science?				
B	**influence on the teacher gender on the level of impact information and communication technology**				
6	Both male and female Integrated Science teachers have equal access to ICT resources?				
7	Male and female teachers use ICT resources differently?				
8	There are differences in the benefits and challenges of using ICT between male and female teachers?				
9	There are any differences in the recommendations for improving ICT use based on gender?				
C	**Influence on teachers academic qualification on the level of impact information and communication technology**				
10	ICT resources are more beneficial for teachers with higher academic qualifications?				
11	Teachers with different academic backgrounds perceive ICT resources differently?				

12	The level of academic qualifications influence the frequency of ICT use in Integrated Science lessons?				
13	ICT resources are more useful for teachers with more experience?				
D	**Influence on teachers years of teaching experience on the level of impact information and communication technology**				
14	Teachers with more experience use ICT resources more effectively?				
15	Teaching experience affect the attitude towards ICT in Integrated Science lessons?				
16	Teachers with more teaching experience are more likely to use ICT resources?				
17	Teachers with more teaching experience likely to use ICT resources?				
18	Do teachers with more teaching experience find ICT resources more useful?				