

Effect of Information and Communication Technology (ICT) on Teacher Education in Dutse Local Government Area, Jigawa State of Nigeria

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Abstract

Teacher Education is very vital and essential for effective, effective, and functional education which needs to be improved. Information and communication technologies (ICTs) are globally assumed to enhance teaching and learning processes. It is a survey research design conducted in Dutse, Jigawa State of Nigeria, questionnaire and interview schedules were used for data collection, and the data collected was analyzed using simple percentages and mean. The population of the study was comprised of six hundred and seventy-one (671) teachers in the thirty-seven (37) Government Junior Secondary Schools in Dutse Local Government Area of Jigawa State. Based on the proportional sampling technique, one hundred and eleven (111) teachers were selected from the thirty-seven (37) schools in the State that is three (3) teachers were randomly selected from the 37 Junior Secondary Schools to constitute the sample for the study. The study has five objectives translated into five research questions and five hypotheses. The hypotheses were tested at 95% degree of freedom and 0.05 level of significance, all the stated alternate hypotheses were accepted based on the critical values being greater than the calculated value. It was concluded that ICT has an association with teacher education in Dutse Jigawa State, it was recommended that government and policymakers should invest more in terms of integrating ICT into Teacher Education to sustain the benefits of ICT to teacher education.

Keywords: Education, Teacher, Teacher Education, Teaching, Information and Communication Technologies (ICTs).

Introduction

Information and communication technologies (ICTs) are defined as a diverse set of technological tools and resources used to transmit, store, create, share, or exchange information. These technological tools and resources include computers, the Internet (websites, blogs, and emails), live broadcasting technologies (radio, television, and webcasting), recorded broadcasting technologies (podcasting, audio, and video players, and storage devices), and telephony (fixed or mobile, satellite, Visio/videoconferencing, etc.) (UNESCO, 2017).

The Information and Communication Technologies (ICTs) in teacher education is a key issue, especially in preparation for inspiring teachers. ICT is at the first peak priority for

those who prepare educators for effective teaching and lesson delivery. Developed countries like Germany, the United States of America (USA), the United Kingdom (UK), Japan, Turkey, and many other countries have recognized the need for ICT for teacher education and its roles in future teaching and learning processes, that is why they are developing strategies and models to integrate ICT into holistic education and teacher education systems (Khan & Shah 2014).

Teachers must structure their role by organizing the way students acquire cognitive competencies and manage to apply them in different situations (UNESCO, 2018). Classroom teaching will require new spaces to add to current knowledge with technological media by both students and teachers. The emergence of ICTs easily fits into this process. Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and much of it is available to teachers as well as students at the same time. Modern developments of innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers and students to use these new technologies in the teaching and learning process (Okemakinde, Adewuji & Alabi, 2013).

ICT to be used to meet the educational objectives of teaching and learning, and the teachers and teacher educators must be engaged and wired, as the members of same community with the provision of a role model of good ICT practices, learn to share and build knowledge, understand the implication of the ICT and discuss its impact on students and teacher satisfaction, too, as long as teachers are trained well, computers can create a better teaching and learning atmosphere at the institutions (Naik & Raman, 2015).

Statement of the Problem

Teacher Education remains central to any academic achievement, ICTs provide a window of opportunity for educational institutions and other organizations to harness and use technology to complement and support the teaching and learning process. However, despite the enormous advocacy of ICT-aided teaching and learning, the integration of ICT in education still faces the challenge of how to transform the teacher education learning process to provide students with the skills to function effectively in this dynamic, information-rich, and continuously changing environment. The cause of concern is that unless this problem is addressed, investment in the development of ICT in education is going to be put to waste and improvement in the quality of teaching and learning is going to be sluggish. This may make the Education system fail to achieve its goal and to produce teachers who are ready for the world of work which is increasingly reliant on aided generation and dissemination of knowledge. Given this discrepancy, there is a need to examine the effects of ICTs in the development of JSS teachers in Dutse, Jigawa State, Nigeria.

Objectives of the Study

The main purpose of the study is to assess the effects of ICTs on Teacher Education in JSSs in Dutse, using a cross-sectional survey design to provide relevant recommendations.

The specific objectives were:

1. To examine the effect of ICTs on the production of efficient and motivated teachers;
2. To examine the effect of ICTs on enhancing teachers' commitment to the teaching profession; and national development;
3. To assess how ICTs help teachers to fit into the social life of the community, and society at large and to enhance their commitment to national goals.
4. To assess the effect of ICTs on teachers' intellectual and professional backgrounds adequate for teaching-learning.
5. To assess the effect of ICTs on teachers' inquiry and creativity.

Research Questions

The study was guided by the following research questions:

1. What is the effect of ICTs on the production of efficient and motivated teachers?
2. How ICTs enhance teachers' commitment to the teaching profession and national development?
3. How ICTs help teachers fit into the social life of the community, and society at large and enhance their commitment to national goals?
4. What is the effect of ICTs on teachers' intellectual and professional backgrounds adequate for their assignment?
5. What are the effects of ICTs on teachers' inquiry and creativity?

Research Hypotheses

The study was guided by the following research hypotheses:

- H1.** The ICTs have positive effects on the production of efficient and motivated teachers.
- H2.** The ICTs have positive effects on teachers' commitment and national development.
- H3.** The ICTs have positive effects on helping teachers to fit into the social life of the community, and society at large and to enhance their commitment to national goals.
- H4.** The ICTs have a positive effect on teachers' intellectual and professional backgrounds adequate for their assignments.
- H5.** The ICTs have positive effects on teachers' inquiry and creativity skills.

Review of Related Literature

The review of related literature started with the conceptual review of concepts of education, teacher, teacher education, and Information and Communication Technology (ICT) and concluded review of the related empirical studies.

Education: is the process of facilitating learning or the acquisition of knowledge, skills, values, beliefs, and habits. Quality education specifically entails issues such as appropriate skills, development, gender parity, provision of relevant school infrastructure, equipment, educational materials and resources, scholarships, or teaching force (UNESCO, 2017). Education is a systematic process through which a child or an adult acquires knowledge, experience, skill, and sound attitude that his society requires (World Bank, 2014). It makes an individual civilized, refined, cultured, and educated. Its goal is to make an individual perfect. Education is one of the most important drivers for ending poverty and boosting shared prosperity.

Adeyinka, (2020) defined education as: “the process of transmitting the culture of a society from one generation to the other, the process by which the adult members of a society bring up the younger ones”. The above definitions imply that education is a gradual development of the body and mind from infancy to adulthood. Related to Bloom’s taxonomy, it implies a progressive development of the cognitive, affective, and psychomotor domains (or areas) of knowledge. It is, indeed, a three-stage process:

- First a generation inherits the culture of the society from the older generation.
- Second, they change that culture, for better or for worse – or, we could say, they modify the culture they inherited and adapt it to their situation: the political, social, and economic situations of their time.
- Third, they pass on the modified culture to the generation following them.

Teacher: A teacher is a person who instructs, guides, mentors, and facilitates instruction, knowledge, skills, and competence through the process of teaching and learning (Aliyu, 2022). A teacher is responsible for transmitting knowledge to the learner in the classroom environment or any suitable setting. Teachers remain instructional leaders and there is always a need for human interaction and motivation (Long & Long, 2019).

According to Awatefe, & Umudi, (2020), ICT impacts on teachers as follows: The balanced roles they play with a perceived risk of reduced influence, Teachers are provided great information access that leads to increased interest in teaching and experimentation; creates more avenues for collaboration and communication with other teachers, administrators, and parents, and provides more engagement time for learners that leads to greater productivity.

Teacher Education: Teacher education refers to the professional education of teachers towards the attainment of attitudes, skills, and knowledge considered desirable to make them efficient and effective in their work by the needs of society at any point in time. It includes training/education occurring before the commencement of service (pre-service) and education/training during service (in-service or on-the-job). Teacher education should constitute a conspicuous element in the totality of organized education, both formal and non-formal sub-systems (Awatefe, & Umudi, 2020).

It is very relevant that the Federal Republic of Nigeria realizes that no education system can rise above the quality of its teachers. Teacher education shall continue to be given major

emphasis in all educational planning and development. This is aptly articulated in Nigeria's National Policy of Education of 2004 when the goals of teacher education were stated as follows:

- i. To produce highly motivated, conscientious, and efficient classroom teachers for all levels of our education system.
- ii. To encourage further the spirit of inquiry and creativity in teachers.
- iii. To help teachers to fit into the social life of the community, and society at large and to enhance their commitment to national goals.
- iv. To provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to any changing situation not only in the life of their country, but in the wider world, and
- v. To enhance teachers' commitment to the teaching profession.

Information and Communication Technologies (ICTs): ICT is a term with different meanings to different scholars. Ratheeswari, (2018) sees ICT as a term that encompasses several activities involving the acquisition, storage, processing, and dissemination of information with the appropriate software and hardware-designed facilities for that purpose. ICTs are a generic term referring to technologies that are used for collecting, storing, editing, and passing on (communicating) information in various forms (UNESCO, 2018).

According to Kaur 2016, "ICT generally relates to those technologies that are used for accessing, gathering, manipulating, and presenting or communicating information" It means ICT is applied to the creation, storage, selection, transformation, and distribution of information of many kinds. ICT is a comprehensive term that includes any communication device or application such as radio, television, cellular phones, computer and network, hardware and software of ICT, satellite systems as well as the various services and applications associated with them, such as videoconferencing and distance learning.

ICT is an umbrella term that includes any communication device or application, encompassing radio, television, cellular phones, computer and network hardware and software, satellite systems, and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning (Yusuf and Afolabi, 2014). Information and Communication Technology (ICT) is the scientific, technological, and engineering discipline and management techniques used in information handling and processing, their application; computers and their interaction with men and machines and associated social, economic, and cultural matters" (UNESCO, 2018).

Teacher education institutions have chosen different strategies to introduce ICT into their pre-service training, for example, increasing access to ICT, offering ICT courses, integrating ICT into all courses, introducing multimedia approaches such as e-portfolios, staff in-service training, collaboration through developing communities of practice, modeling strategies such as showing good examples, and so forth. Usually, a combination of strategies is used (Kaur, 2016).

Chandra and Patker (2017) have described the development of ICT in teacher education as emerging in three waves. The use of ICT has gone from the storage and transfer of knowledge to the delivery of skills needed in a changing society, and finally to a tool for lifelong learning. The focus has moved from mainly learning *about* ICT to learning through ICT, a shift that corresponds with the policy intentions.

Information and communication technology (ICT) is one of the most important driving forces promoting teaching and learning. It has influenced all aspects of Teacher Education. It provides the capacity to store, retrieve, and process e-content both fast as well as accurately. ICT is the scientific and technological discipline, which deals with the collection, storage, and dissemination of information to the individual or group. ICT involves primarily the storage and communication of information. The world is converted into a minute global capsule and anyone desirous of information would find it only a click. ICT is a technology that aids in the storage of data, retrieval as and when required, telecommunication, and browsing for information, and saves time, effort, paper, money, and resources. ICT represents one of the current applications of technology in Teacher Education.

However, studies have revealed that teacher education programs have been slow to adopt the pedagogical use of ICT. Despite the efforts made to encourage the use of ICT in teacher education, with few exceptions, student teachers seem generally disinclined to use ICT for their coursework (Afe, et al, 2014).

The application of ICT is mainly based on the teaching-learning process. The application of ICT provides a vast array of powerful tools that may help in transforming the present isolated, teacher-centered, and text-bound classroom, UNESCO in its World Education Report "Teachers and Teaching in a Changing World" described the radical implications of ICT in the conventional teaching-learning process. In the present situation, ICT has become an important integral part of the curriculum of Teacher Education. The following essential conditions must be met for the effective use of ICT in the teaching-learning process. Students and teachers must have sufficient access "to digital technologies and the Internet in their classrooms, schools, and Teacher Education institutes; High quality, meaningful, and culturally responsive digital content must be available for teachers and learners. Teachers must have the knowledge and skills to use the new digital tools and resources to help all students achieve high academic standards. The use of ICT can make substantial changes in education and training mainly in two ways.

Benefits of ICTs to Teachers and Teacher Education

ICTs are now set to become instrumental in helping expand access to teacher education, strengthen the relevance of teacher education to the increasingly digital workplace, and raise teacher educational quality, helping make teaching and learning into an engaging, active process connected to real life. Naik P.K. and C.V. Raman, (2015) said ICT has a great role in the context of teacher education which includes: envisages excitement in the student teacher's eyes, ears, and more importantly the head, fulfills the needs of student teachers by providing items and packages of higher standards and interest, transforming the

definition of literacy, learning, and knowledge; a definition that increasingly includes multimedia digitized literacy. More so, multimedia provides a kind of control over the learning environment to the pupil teachers, and they experience learning from their failures, ICT facilitates the student teachers to have control over lessons, pace sequence, content, and feedback, which in turn enhances the efficiency of learning. Unlike books, it is interactive in nature and creates motivation and interest among pupil teachers in turn meeting the individual unique needs effectively and efficiently, which develops the ability to self-learn and interact individually.

ICT-driven distance education programs where the teachers are given new opportunities for the acquisition of new knowledge within their walls.

Thus, ICT is a powerful new development with an ambitious role in teacher education, Digital and Internet-based multimedia transforms the present trend in the field of education as follows:

to enhances the initial preparation by giving good teaching and training materials, use of simulators, recording, and feedback in teaching, teachers can access colleagues, schools, institutions, universities, expertise, and rich resources in cyberspace, ICT enables interaction with students over a physical distance, ICT facilitates the sharing of ideas, and experiences as well as collaborating on projects, and exchange of materials through virtual communities, and it helps in the effectiveness of the classroom management.

Educational software and intelligent tutoring systems can dramatically reduce the cost of teacher training, and provides lifelong professional development by providing courses in a virtual situation, training on demand, orientation, and refresher courses through videoconferencing and online. It also helps in the effective use of ICT software and hardware for teaching–learning process. It helps in improving Teaching skills, and innovative teaching and also helps in improving professional Development and Educational management as well as enhances the Active Learning of teacher Trainees (Cantoni, & Danowski, 2015).

As we know nowadays students always have competitive minds. So, the teacher must know the subject; this can be achieved easily with the aid of ICT, lesson preparation, lesson delivery, and learners' and lesson evaluation. To introduce ICT in pre-service teacher education different methods and strategies are applied. Different tools are used such as word processing, Database, Spreadsheet, etc. Various technology-based plans are used to help the teachers in their practice teaching (Cantoni, & Danowski, 2015).

ICT prepares teachers for the use of their skills in real classroom situations and prepares students for their future occupations and social life; ICT is used as an „assisting tool“ for example while making assignments, communicating, collecting data & documentation, and conducting research. Typically, ICT is used independently from the subject matter and as a medium for teaching and learning. It is a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn. It appears in many different forms, such as drill and practice exercises, simulations, and educational networks, and is a popular tool for organization and management (Peretomode & Bello, 2018).

According to Baishakhi and Kammal (2016), ICT is very important for pre-service teacher education programs in the 21st century. Without proper knowledge of ICT, a teacher cannot perform in his or her classroom. Also, Ghavifekr and Rosdy (2015) affirmed that the integration of ICT will assist teachers with the global requirement to replace traditional teaching methods with technology-based teaching and learning tools and facilities. Thus, ICT provides complementary support for both teachers and students that involves effective learning with the assistance of computers to serve the purpose of learning aids.

Effects of Information Communication Technology

- Information Technology enables greater imaginative understanding through increased access to information and new ways of accessing and communicating information.
- It gives the individual the power to take risks and make mistakes that are costly in terms of time/material.
- It provides new forms and structures for representing knowledge and individuals' relationship with it.
- It increases the opportunity for interrelation and application of data.
- It provides the opportunity to develop clear logical thinking, sequential understanding, and study skills.
- It changes the nature of composition and authorship because the forms of composition are more numerous than they have been and the facility to combine original and second-hand material and integrate different media.
- It enables the recording process to take place while it is being used.
- It enhances the learner's capacity to reflect upon and the teachers' opportunity to intervene in the learning (Sharma, 2019).

Matthew et al identified problems of teacher education in Nigeria that have witnessed tremendous challenges resulting from socio-economic, political, and technological advancements in Nigeria's depressed economy. The quality of teacher education is very much in doubt. Teacher education has not been innovative concerning instructional methods. Obsolete textbooks and teaching methods are still very much in vogue. The curriculum practices are theory-oriented rather than actual practice in the world of work. In addition, the quality of the programs is also largely determined by those who teach the teachers. It is a matter of regret and lamentation that most teacher educators cannot be described as professional teachers since they possess degrees such as B.A. (Hons), B.Sc. (Hons), etc. in a single subject discipline without educational background. The implication of this for teacher education is a decline in academic standards.

In Nigeria, teacher education has no well-defined system for assessing its quality and evaluating its outcomes. Okolo, (2013) posits that the sole purpose of setting up the NCCE and by extension other tertiary education regulatory agencies (NUC and NBTE) which have supervisory functions over teacher education programs in their respective institutions is to institutionalize quality assurance and evaluation. For whatever reason, these agencies have

solely utilized the accreditation approach rather than the more dynamic approaches of holistic stakeholder evaluation and peer-review mechanisms. For teacher education, the later approaches ensure more of the institutionalization of quality assurance and evaluation for both pre-service and in-service teacher education programmes. Indeed, experience in Nigeria only shows that the accreditation approach to quality assurance in teacher education only fosters make-shift quality make-ups in institutions with no follow-up measures of outputs and products of programs accredited.

Teaching practice is a vital component of teacher education program. Unfortunately, little attention is devoted to the effective organization of teaching practice in our teacher colleges. There is indeed a wide variation in the amount of time that students spend on teaching practice. Some institutions organize teaching practice for a whole term, some in six weeks and some in a whole year. These consequential differences affect the standard and invariably quality of teacher education in Nigeria. Moreover, teaching practice supervision is susceptible to numerous biasing factors. In the first place, some teaching practice assessment instruments are subjective and interpreted in various ways depending on the supervisor's orientation, training, and disposition.

In-Service Education: Whatever administrative arrangements or curricular proposals are made, change in the educational system ultimately depends on teachers. As a matter of policy, this requires the handwork of well-trained and dedicated teachers in the Nigerian school system who are agents of civilization and teachers of the nation. Therefore, improving the quality of teachers and establishing innovations in education are the rationale behind in-service education to the fast development of Nigeria's economy.

System of Institution Accreditation: The system of accreditation of teacher education programs in Nigeria at the various institutions and faculties leaves much to be desired. They are in the hands of diverse bodies that are crisis-ridden and bedevilled by administrative bottlenecks. It is sad to note our present system of accreditation of faculties and institutions for the running of teacher education programs is haphazard and unsatisfactory. There are too many uncoordinated and uncooperative agencies and authorities involved such as University Senates, the National Board for Technical Education (NBTE), the National Universities Commission (NUC), Federal and State Ministries of Education through such bodies as the Joint Consultative Committee on Education (JCC) the National Council for Education Commission for Colleges of Education (NCCE) and the Teachers Registration Council (TRC) that maintains a national register and code of conduct for teachers.

Poor Funding: Teacher education is bedevilled by poor funding from all levels of government, this has resulted in the inadequate provision of teaching and learning materials, obsolete textbooks, dilapidated school buildings, overcrowded classes, and ill-equipped classrooms lacking in sophisticated Information and Communication Technology (ICT) systems. It is sad to note that the Nigerian government devotes less than 26% of its national budget to education which is far below the standard prescribed by UNESCO. As a result, the quality of products from this system is in doubt.

Ani, Onyia and Iketaku. (2013) assessed teacher education in Nigeria today and recognized that it is the foundation of the nation's educational system, which contributes significantly to the development of other sectors in the nation's economy. The COVID-19 pandemic outbreaks in Nigeria in the last twelve months have adversely affected teacher education programs in Nigeria leading to the suspension of academic and research activities in the institutions because of nationwide lockdown for seven months. This study specifically focuses on how Nigeria aims to achieve a buoyant and efficient economy and accelerated transformation through the production of high-quality and well-motivated teachers for all levels of education by integration of Information and Communication Technology (ICT), into teacher education programs. The study examined the impact of the COVID-19 Pandemic on teacher education programs in Nigeria and justified the inevitable need for integrating ICT into teacher programmes. It also identified the challenges of ICT utilization in teacher education programmes in Nigeria. It was recommended among others that the stakeholders must endeavour to provide the teacher education institutions with modern ICT tools and facilities for effective teaching, learning, conducting research and dissemination of information in the institutions, to achieve the lofty goals of teacher education in Nigeria.

Oboh, & Ufuom (2014), The impact of information communication technology (ICT) on Nigeria's education system was the crux of the matter for this paper. Information technology is the use of electronic equipment to process, store, and disseminate information to, an worldwide audience. It also refers to technologies used in collecting, storing, editing, and passing on information in various forms. The impact of ICT on Nigeria's education system includes supporting learning and providing learners with technological advancement, helping teachers to assess information, assisting in their skills development, and providing more engagement for greater productivity, etc. Recommendations include the connection of public and private schools to the national grid, the supply of uninterrupted and affordable power supply, government formulation of national ICT policy, training and retraining of ICT staff and learners the provision of ICT facilities in tertiary institutions and making ICT learning compulsory from primary to tertiary school levels.

Chris, 2016 studied the impact of information and communication technology (ICT) on teaching and learning in Nigerian tertiary institutions. This study investigated the availability and utilization of Information and Communication Technology (ICT) facilities by Teacher Educators for effective teaching and learning in Nigerian Universities, using descriptive survey research design. The research findings indicated that ICT has a great impact on teaching and learning in tertiary institutions in Nigeria. Also, the introduction of ICT makes learning so interesting for the students. The findings also revealed that ICT facilities which serve as a major contributor to effective teaching and learning in teacher education programmes were not available. Based on the findings suggestions and recommendations were made. The study recommends among other strategies for its (ICT) maximum utilization; that ICT facilities should be made available for effective teaching and learning of teacher education programs.

According to (Aliyu, 2022) Teacher Education, Information and Communication Technology: Prospects and Challenges of E-Teaching Profession in Nigeria. In Nigeria, teacher education has been bedevilled with a lot of challenges in the modern-day technology of imparting knowledge in the teaching and learning process. Information and Communication Technology (ICT) is relatively a very new development in the Nigerian educational system. ICT plays a significant role in teacher education. Hence, the objective of this paper is to discuss the prospects of ICT in teacher education as well as its challenges in the E-teaching profession in Nigeria. The findings via descriptive research revealed that many teachers in Nigeria are not using ICT facilities in the teaching-learning process due to some challenges which include the high exorbitant price of ICT facilities, lack of infrastructures in the areas of electricity supply, lack of adequate trained manpower for the development, maintenance, and operation of ICT facilities, lack of commitment on the part of government towards the development of ICT, inadequate funding of internet connectivity and lukewarm attitude of many teachers to be computer literate among others. This paper proffers some probable ways of improving ICT in teacher education in Nigeria. It concludes that the importance of ICT in teacher education to improve the quality of teaching and learning processes in schools cannot be over-emphasized.

Research Methodology

The data for the study were sourced from both primary and secondary data sources, the primary data was obtained by administering a structured questionnaire to the teachers of Government Junior Secondary Schools in Dutse while the secondary sources are literature from textbooks, journals, and other ministries documents.

The population of the study was comprised of six hundred and seventy-one (671) teachers in the thirty-seven (37) Government Junior Secondary Schools in Dutse Local Government Area of Jigawa State. Based on the proportional sampling technique, one hundred and eleven (111) teachers were selected from the thirty-seven (37) schools in the State that is three (3) teachers were randomly selected from the 37 Junior Secondary Schools to constitute the sample for the study. A total of hundred eleven (111) questionnaires were distributed and ninety-eight (98) questionnaires representing 96% were returned and used for the study.

Table: 1 Questionnaire Distribution

	Number	Percentage
Distributed	111	100%
Returned	98	88.3%
Unreturned	13	11.7%

Source: researcher, 2024

Table 1 shows that 111 questionnaires were distributed, and 98 questionnaires were returned, which was 88.33% of the questionnaires distributed, this constitutes the sample size of the study.

Data collected was analysed using simple percentages and presented in frequencies and tables.

Research Question 1

Table 2: What is the effect of ICTs on the production of efficient and motivated teachers?

	Number	Percentage
Agreed	72	73%
Disagreed	18	19%
Undecided	8	8%
Total	98	100%

Source: researcher, 2024

Table 2 shows that 72 (73%) teachers were of the view that ICT helps in the production of motivated and efficient teachers, 18 (19%) teachers disagreed while 8 (8%) teachers were undecided.

Research Question 2

Table 3: How ICTs enhance teachers' commitment to the teaching profession and national development?

	Number	Percentage
Agreed	67	68%
Disagreed	24	25%
Undecided	7	7%
Total	98	100%

Source: researcher, 2024

Table 3 shows that 67 (68%) teachers were of the view that ICT helps in improving teachers' commitment and national development 18 (19%) teachers disagreed while 8 (8%) teachers were undecided.

Research Question 3

Table 4: How ICTs help teachers fit into the social life of the community, and society at large and enhance their commitment to national goals?

	Number	Percentage
Agreed	69	71%
Disagreed	22	22%
Undecided	7	7%
Total	98	100%

Source: researcher, 2024

Table 4 shows that 69 (71%) teachers were of the view that ICTs help teachers fit into the social life of the community and society at large and enhance their commitment to national goals. 22 (22%) teachers disagreed, while 7 (7%) teachers were undecided.

Research Question 4

Table 5: How ICTs affect teachers’ intellectual and professional backgrounds adequate for their assignment?

	Number	Percentage
Agreed	74	76%
Disagreed	17	17%
Undecided	7	7%
Total	98	100%

Source: researcher, 2024

Table 5 reveals that 74 (76%) teachers were of the view that ICT has a positive effect on teachers’ intellectual and professional background adequate for teaching and learning, while 11 (19%) teachers disagreed, while 6 (6%) teachers were undecided. This implies the alternate hypothesis is accepted.

Research Question 5

Table 6: What are the effects of ICTs on teachers’ inquiry and creativity?

	Number	Percentage
Agreed	81	83%
Disagreed	11	11%
Undecided	6	6%
Total	98	100%

Source: researcher, 2024

Table 6 reveals that 81 (83%) teachers were of the view that ICT helps in the effect of ICTs on teachers’ inquiry and creativity 11 (11%) teachers disagreed while 6 (6%) teachers were undecided.

Hypothesis Testing

The 5 alternate hypotheses derived from the objectives of the study were tested at a 0.05 level of significance; The collected data was analysed using a Chi-Square statistical tool to test the hypotheses. The critical (table) value of Chi-square at 95% degree of freedom at a 0.05 level of significance is 101. 87.

Table 7: Hypotheses Testing Decision Table

Hypotheses	Calculated Value	Decision
Hypothesis 1	106.03	Accepted
Hypothesis 2	123.70	Accepted
Hypothesis 3	103.48	Accepted
Hypothesis 4	109.97	Accepted
Hypothesis 5		Accepted

The calculated values of all the hypotheses were greater than the critical (table) value of 101.87 which implies that the alternate hypothesis is accepted.

Result

Based on the data collected and analyzed all five research questions translated into five alternate hypotheses were tested and accepted, implying that ICTs have positive effects on the production of efficient and motivated teachers, enhance teachers’ commitment to the teaching profession; and national development, help teachers to fit into the social life of the community, and society at large to enhance their commitment of national goals. It also has positive effects on the development of teachers' intellectual and professional backgrounds adequate for teaching-learning and teachers’ inquiry and creativity skills.

Therefore, the utilization and integration of ICTs in the educational system and services are very much vital and essential and they will enhance achieving Nigeria's educational goals in general and teacher development in particular.

Conclusion

The adoption and use of ICTs in schools have a positive impact on teacher education, teaching, learning, and research. Despite the challenges ICTs in education encounter. Nigeria has yet to extensively adopt them for teaching and learning. Efforts geared towards the integration of ICTs into the school system, have not had much impact. Problems such as poor policy and project implementation strategies and poor information infrastructure militate against these efforts.

Firstly, the rich representation of information changes the learner’s perception and understanding of the content. Secondly, the vast distribution and easy access to information can change the relationship between teachers and students. ICT can also provide powerful support for educational innovations. By using ICT technologies, we can overcome all barriers to communication and instruction. ICT can be used as a tool for training and support of teachers, regardless of geographical dispersion. Therefore, the

challenge for teachers and Teacher Education institutions has been to create a new generation of teachers capable of employing a variety of technological tools.

Recommendations

Based on the result of the study Information and Communication Technology has positively impacted on teacher education in Jigawa state of Nigeria, to ensure that positive impact is sustain ICTs should be continuing to be adopted widely in teacher education in the state, and should be made compulsory for all primary and secondary school students. In addition, the state government should ensure that ICT programs and office should be adequately funded and ensure the available resources are rationally allocated and efficiently utilized. Similarly, ICT should be integrated in all subjects at all levels of learning. Furthermore, more efforts should be made by the Ministry of Education for training and retraining of teachers in the field of ICT knowledge and skills and equitable distribution of teachers with ICT knowledge and skills a cross all the schools in the state.

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