Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 3, Number 3, September, 2023
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.zijefugusau.com.ng

Efficacy of Information and Communication Technology (ICT) Skills on Competency Level among Secondary School Computer Teachers in Zamfara State

Tafa, Taofik O.[1]
Email: taofiktafa@gmail.com
Tel: +2348036044015

Adeyemo, Sarafa O.[1]
Email: adeyemoso2003@yahoo.com
Tel: +2348036351533

Abubakar, Barikisu O.[2]
Email: omenekeba@gmail.com
Tel: +2348051997650

Isah, Khadijat O.[2]
Email: ozavisa338@gmail.com

[1]Department of Computer Science, Federal College of Education (Technical) Gusau
[2]Department of Computer Science, Federal College of Education Okene

Abstract
This study examined efficacy of ICT skills on competency levels of computer teachers in Zamfara state. The study is descriptive research of a survey type. A structured questionnaire tagged "ICT needs and competence level among secondary school computer teachers in Zamfara State" was used to generate data for the study. The reliability of the instrument was determined using Cronbach Alpha and the Alpha value was found to be 0.73. Draft questionnaire was presented to experts and specialists in ICT for face validation. The target population for the study was computer studies teachers in Zamfara State during the 2021/2022 academic session. A sample size of fifty (29 males and 21 females) computer studies teachers were randomly selected from public and private schools in Zamfara state, representing about 10% of the entire computer teachers in the state. The research questions were analyzed using frequency count and percentage and hypotheses tested using t-test statistical and analysis of variance (ANOVA) at 0.05 level of significance. The study revealed that computer studies teachers in Zamfara state are aware they need to be ICT literate to effectively teach their computer studies. Findings also revealed that the teachers have higher competence level in the use of ICT for instructional purposes. The study therefore concluded that the teachers who are the final instrument in curriculum implementations have the desired competency in the utilization of ICT for instructional purposes. Therefore, appropriate integration of ICT in education, especially at the lower level, should not be neglected so as to bring about effective and efficient educational system. Alternative power supply should also be made available for ICT facilities in schools.
Keyword: Competency, computer studies, ICT, teacher

Introduction
Globalization and the incorporation of information and communication technology (ICT) in all spheres of life have created a society which is motivated by knowledge and driven by technology. In recognition of the potentials of ICT, Zurich (2013) cited in Hilty and Aebischer (2015) observed that ICT made teachers' work more sustainable: saving energy and materials resources by creating more value from less physical input, increasing quality of life forever more people without compromising the future generation ability to meet their needs. ICT is the range of technologies that are applied in the process of collecting, storing, editing, retrieving, and transfer of information in various forms (Olakulehin, 2007 as cited in Danner & Pessu, 2013). The potentials and role of ICT as a tool for contributing to development is limitless and well established. Bolaji and Adeoye (2022) referred to ICT as empowering tool that encourages and stimulates changes and development in 21st century. ICT is used within the school setting as tool for school administration and management, presentation of classroom work, teaching and learning interesting tasks, teaching and learning intellectual, thinking and problem-solving skills, stimulating

creativity and resourcefulness, communication tools by teachers and students. ICT is therefore unavoidable tool in all human endeavors, especially in the area of education (Bolaji & Jimoh, 2023).

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2013) stated that ICT can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development, efficient management, governance and administration. Mustapha and Oladimeji (2021) asserted that the purposes of teaching in education process is considered vital especially when we consider teaching and learning process as the acquisition of knowledge and skills by individuals to enable him become worthwhile member of the society. While Jegede (2008) cited in Oyeronke and Fagbohun (2013) opined that ICT is now recognized as an crucial ingredient for producing 21st century learning environment, Lau and Sim (2008) cited in Oyeronke and Fagbohun (2013) reported that despite the benefits of the use of ICT for educational purpose, studies showed that in many cases, the learning potential of ICT is deprived as many teachers are still not fully ICT literate. Modern developments in innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching (Sayfullayeya et *al*., 2021).

Competency is the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform critical work functions or tasks in a defined work setting. Competency serve as the basis for skill standards that specify the level of knowledge, skills, and abilities required for success in the workplace as well as potential measurement criteria for assessing competency attainment (Wagenaar, 2014). Competency is a set of attributes covering knowledge, skills and attitudes for enabling one to effectively perform the activities of a given occupation or function to the standards expected in employment (Adeoluwa & Ogunmodede, 2018). Balogun and Yusuf (2019) asserted that teachers' competence is of concern when new subjects or media are integrated into the school system. This is because teachers' capability and competence will form the root of their ability to implement the innovation in schools. The idea of competence with regard to the use of ICT in education is broader than the technical skills needed to use ICT. The type of ICT competence needed by teachers is a collection of knowledge, skills and attitudes that are inseparably bound up with the framework and pedagogy. Competency ethics, as opined by UNESCO (2013) are often closely tied to local ethics for students, so that expected student outcome in a particular field of study implies a set of competencies with ICT that their teachers should possess, and as such needs to be entrenched in teacher practices. Thus, this study examines efficacy of ICT skills on competency levels of computer teachers in Zamfara state.

Despite the strength of the rapid spread of technology around the world in recent time, there is a decline in the academic performance in computer studies in the country. This poor performance has been recorded for some years by the examining bodies of Junior Secondary Certificate Examination (JSCE), school promotion examinations and the qualifying examinations conducted by the State Ministry of Education. This poor performance has been ascribed to non-availability of ICT resources and teachers' lack of the necessary digital competence to utilize ICT in instruction delivery (Olelewe & Okwor, 2017). It has also been recorded in the past according to Collins and Halverson (2018), that pupils acquire skills in computer technology which makes them fit into the society properly and the reverse is now the case as students on completion of the course cannot carry out simple daily maintenance on technological appliances. Several complains have been attributed to this among which is schools' lack of organization of workshops for teachers on the utilization of ICT in instructional delivery of content, teachers' enrolling for professional development programmes in which their employers gave no approval resulting to low input as expected and parents' little or no effort to support or address the utilization of ICTs in instructions during Parents Teachers Association (PTA) meeting. Hence, the essence of the study is to examine ICT needs and competence level of Computer Studies teachers in Zamfara State.

Objectives of the study

The purpose of this study is to find out efficacy of ICT skills on competency levels of computer teachers in Zamfara state. Specifically, the study:

1. ascertain the needed ICT skills required of computer studies teachers for effective teaching enhancement in Zamfara state.
2. determine the level of ICT use by computer studies teachers in Zamfara state.
3. examine the level of ICT competence of computer studies teachers in Zamfara state.
4. determine the challenges of using ICT to teach computer studies in Zamfara state.

Research Questions

1. What are the needed ICT skills required of computer studies teachers in Zamfara state?
2. What is the level of ICT utilization by computer studies teachers in Zamfara state?
3. What is the level of competence of computer studies teachers in the use of ICT in Zamfara state?

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 3, Number 3, September, 2023
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.zijefugusau.com.ng

4. What are the challenges of using ICT in teaching computer studies in Zamfara state?

Hypotheses

Based on the research questions, the following hypotheses were tested.

H01: There is no significant difference between male and female computer studies teachers' competence in the use of ICT in Zamfara state.

H02: There is no significance difference in the use of ICT by computer studies teachers based on qualification in Zamfara state.

Methodology

Descriptive survey research design was adopted for the study. The method was used to allow the researchers to have a vivid description of the topic for the purpose of making generalization. The population for this study comprised of all computer studies teachers in Zamfara state. A sample size of fifty (29 males and 21 females) computer studies teachers were randomly selected from public and private schools in Zamfara state, representing about 10% of the entire computer teachers in the state. A structured questionnaire tagged "ICT needs and competence level of computer studies teachers in Zamfara State" was used to gather data on the study. The instrument consists of two sections. Section 'A' requested the respondents' demographic information like gender, qualification and school proprietorship. The section 'B' contains the items developed under each research questions raised in the study. This section contains close ended questions which restricts the respondents to respond on four-point Likert scale which consists of *Strongly Agree (SA), Agree (A), Disagree (D)* and *Strongly Disagree (SD)*. The reliability of the instrument was determined using Cronbach Alpha and the Alpha value was found to be 0.73, indicating high reliability of the instrument for the study. Draft questionnaire was presented to experts and specialists in ICT for face validation and observations and comments were factored into improving the content. Data Collected for the study was analyzed using descriptive statistics of frequency counts and Percentage while t-test statistical tool was used to test the research hypothesis 1 and ANOVA for research hypothesis 2 at 0.05 level of significance.

Results

Table 1: Distribution of respondents based on gender

Gender	Frequency	Percentage (%)
Male	29	58.0
Female	21	42.0
Total	50	100.0

Table 1 shows the distribution of respondents based on gender. The table indicates that 29 respondents representing (58%) were male teachers while 21 of the respondents representing (42%) were female teachers. This shows that both male and female teachers were fairly represented.

Table 2: Distribution of respondents based on qualification

Educational Qualification	Frequency	Percentage (%)
PGDE	7	14.0
B.Ed.	12	24.0
B.Sc.	15	30.0
HND	6	12.0
NCE	10	20.0
Total	50	100.0

Table 2 revealed that 7 of the respondents were PGDE holders constituting 14.0%. Respondents with B.Ed. were 12 which represent 24.0%, 15 of the respondents representing (30%) have BSc degree, 6 of the respondents representing (12.0%) were HND holders. The remaining 10 (20%) have NCE.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 3, Number 3, September, 2023
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.zijefugusau.com.ng

Table 3: Distribution of respondents based on school proprietorship

Proprietorship	Frequency	Percentage %
Public	31	62.0
Private	19	38.0
Total	50	100.0

Table 3 shows that 62% of the respondents were from public schools while 38% were from private schools.

Research Question 1

What are the needed ICT skills required of computer studies teachers?

Table 4: Analysis of the results on the needed ICT skills required of computer studies teachers

S/N	Item	Strongly Agree	Agree	Disagree	Strongly Disagree
1	I need to be literate in using ICT to search and select appropriate information resource for teaching	18 (36.0)	24 (48.0)	6 (12.0)	2 (4.0)
2	I need to be ICT literate to prepare and organized my lesson notes effectively using appropriate computer application	16(32.0)	27 (54.0)	4 (8.0)	3 (6.0)
3.	I need to be ICT literate to keep and organize my students' record effectively using appropriate computer application	20 (40.00)	26 (52.0)	3 (6.0)	1 (2.0)
4.	I need to be ICT literate to customize the presentation of information needed for teaching	17 (34.0)	20(40.0)	10 (20.0)	3 (6.0)
5	I need to be ICT literate to appropriately cite information sources	13 (26.0)	20 (40.0)	12 (24.0)	5 (10.0)

Based on the results in Table 4, responses to the statements (items 1 – 5) shows that majority of the respondents agreed that they need to be ICT literate to search and select resources appropriate for teaching, prepare and organize lesson notes effectively, keep and organize students' record effectively, customize needed presentation for teaching and appropriately cite information sources. It is seen that more respondents believed that ICT literacy is needed to provide better teaching experiences.

Research Question 2

What is the level of ICT utilization in teaching of computer studies?

Table 5: Frequency distribution and percentage on level of utilization of ICT by computer studies teachers

S/N	Items	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	I use ICT for finding and accessing information and educational materials and for preparing lessons	8(16.0)	22 (44.0)	15 (30.0)	5 (10.0)
2.	I use ICT for teaching computer skills	10 (20.0)	21 (42.0)	9 (18.0)	10 (20.0)
3.	I use ICT for making presentation	15 (30.0)	17 (34.0)	13 (26.0)	5 (10.0)
4.	I use ICT for communicating with students	14 (28.0)	15(30.0)	14 (28.0)	7 (14.0)
5.	I use ICT for communicating with other teachers	21 (42.0)	23 (46.0)	5 (10.0)	1 (2.0)

The results in Table 5 indicated that the level of utilization of ICT by Computer Studies teachers. As reflected in the table, majority of the teachers used ICT to find information and relevant education material and prepare lessons, teach computer skills, make presentation as well as communicates with students and colleagues (items 1, 2, 3 and 5 are above 60 percent).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 3, Number 3, September, 2023
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.zijefugusau.com.ng

Over 50 percent of the teachers used ICT to communicate with students. These findings indicate that most computer studies teachers use ICT for getting resources, teaching and communication with students and fellow teachers.

Research Question 3
What is the level of competence in computer studies teachers' use of ICT?

Table 6: Analysis of the results on the ICT competency level of computer studies teachers

S/N	Items	Strongly Agree	Agree	Disagree	Strongly Disagree
1	I am capable of connecting the computer system and its peripherals and booting it	18 (36.0)	32 (64.0)	0 (0.0)	0 (0.0)
2	I have adequate keyboard skills	5 (10.0)	20 (40.0)	19 (38.0)	6(12.0)
3	I can use Microsoft Office Suite Application i.e. MS Word, MS Excel, MS PowerPoint, MS Excel etc.	14 (28.0)	30 (60.0)	3 (6.0)	3 (6.0)
4	I can set up a printer and print documents	12 (26.0)	31 (62.00	5 (10.0)	2 (4.0)
5	I can use Internet and Email Services.	20 (40.0)	28 (56.0)	2 (4.0)	0 (0.0)

The results in Table 6 are on ICT competencies of computer studies teachers. Result showed that the respondents indicated competency in connecting computer and its peripheral, booting the computer, adequate keyboard skills, use of Microsoft office suite packages, setting up of printer and use of internet and electronic mail, items 1,3,4, and 5 (above 50 percent). However, for item 2, only 50 percent agreed to have adequate keyboard skills.

Research Question 4
What are the challenges of using ICT to teach Computer Studies?

Table 5: Frequency distribution and percentage on the challenges facing the Use of ICT to teach computer studies

S/N	Items	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	I have problem of technical support in using ICT to teach computer studies	17 (34.0)	14 (28.0)	10 (20.0)	9 (18.0)
2.	I have problem of time in using ICT to teach computer studies in school	22 (21.0)	20 (20.0)	5 (32.0)	3 (27.0)
3.	I have limited knowledge on how to integrate ICT in teaching computer studies	9 (18.0)	13 (26.0)	20 (40.0)	8 (16.0)
4.	I have problem of non-availability of adequate computer systems for teaching of computer studies	9(18.0)	29 (58.0)	9 (18.0)	3 (6.0)
5	I have the Problem of electricity to use ICT to teach computer studies	32 (64.0)	18 (26.0)	0 (0.0)	0 (0.0)

The results in Table 7 are on challenges faced in using ICT to teach. Most teachers also agreed that they have problems of technical support, appropriate use of time and non-availability of adequate computer systems. Majority however disagreed that on the challenges of knowledge of integration of ICT into teaching of computer studies. This result also shows that the major prevalent problem is electricity which is a national problem, as all the respondents agreed to this (100 percent agreed).

Research Hypothesis 1
There is no significant difference between male and female computer studies teachers' competence in the use of ICT.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 3, Number 3, September, 2023
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.zijefugusau.com.ng

Table 8: Analysis on male and female computer studies teachers' competence in the use of ICT

Gender	N	X	SD	T	DF	Sig. (2-tailed)	Remark
Male	29	2.3220	1.04123				
Female	21	2.3171	1.03535	.023	98	.981	Accepted

Table 8 shows the result of the hypothesis using t-test. It is deduced that there is significant difference between male and female computer studies teachers use of ICT. This is reflected in the result t (98) =0.023, p=0.981>.05. The p-value (.981) is greater than the significance level of 0.05 which indicates that there is no significant difference between male and female computer studies teachers' competence in the use of ICT. Therefore, the null hypothesis is accepted.

Hypothesis 2

There is no significance difference in the use of ICT by computer studies teachers based on qualification.

Table 6: ANOVA analysis on use of ICT by computer studies teachers based on qualification

	Sum of Squares	DF	Mean Square	F	Sig.	Remark
Between Groups	1497.830	5	299.566	1.716	.138	
Within Groups	16405.160	94	174.523			Accepted
Total	17902.990	99				

Table 9 shows the results of the hypothesis test using ANOVA. The results indicate that F (5, 94) = 1.716, P=0.138> 5% alpha level of significance. The hypothesis which states that there is no significance difference in the use of ICT by computer studies teachers based on qualification is accepted since the hypothesis result is greater than 0.05.

Discussion of Findings

The research was aimed at finding out the ICT needs and competence level of computer studies teachers in Zamfara state. The findings of this research revealed that computer studies teachers are competent in the use of ICT for teaching. This is against the report of Kirschner and Selinger (2003) as cited in Adeoluwa and Ogunmodede (2018) that the vast majority of teachers do not know how to use the computers to promote educational efficiency, and they are not adequately trained to use modern information media. It also confirms the assertion that teachers have developed competence in the use of ICT. The findings indicated some challenges faced in the effective utilization of ICT for teaching computer studies. These barriers as attested to by the teachers included lack of technical support, shortage of computers and other ICT tools in schools. The findings also show that the major prevalent problem is electricity which is a national problem.

Conclusion

This study has discovered that computer studies teachers in Zamfara state are aware they need to be ICT literate to effectively teach their subjects. These findings are in accordance with that of Balogun and Yusuf (2019) which disclosed that teachers are competent in the use of ICT for teaching purposes. Also, computer studies teachers in Zamfara state have higher competence level in the use of ICT for instructional purposes. It can therefore be deduced that the teachers who are the final instrument in curriculum implementations have the desired competency in the utilization of ICT for instructional purposes. Thus, the appropriate integration of ICT in education, especially at the lower level, should not be neglected so as to bring about effective and efficient educational system.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. The government (at all levels; federal, state and local) should provide adequate ICT facilities in schools. Through this, the problem of insufficient computers and facilities will be minimized.
2. The government should provide frequent professional development programmes for teachers to update themselves of emerging technology
3. The government and curriculum developers should make available, suitable educational software by seeking the assistance of software developers, and this software should be affordable or be free for school use.
4. The teachers' salary should be made attractive to encourage ICT competent teachers to apply for teaching job.

5. Alternative power supply be made available for ICT facilities in schools.

Acknowledgements

We will like to extend our gratitude and appreciation to Zamfara State Teachers Service Board (TSB) and Female Education Board (FEB) for providing information that are relevant to the study. We also appreciate the cooperation and understanding received from management and staff of schools that participated in this study.

References

Adeoluwa, O. V. & Ogunmodede, A. S. (2018). Lecturers 'competency and utilization of ICT facilities in the delivery of accounting lectures in tertiary institutions in Ekiti state. *Journal of Counselling and Applied Psychology (JOCAP), 4*(2), 96-102.

Balogun, I. N. & Yusuf, A. (2019). Teaching civic education to learners through best practices. *Anatolian Journal of Education*, *4*(1), 39-48.

Bolaji, H. O. & Adeoye, M. A. (2022). Accessibility, Usability, and Readiness Towards ICT Tools for Monitoring Educational Practice in Secondary Schools in Ilorin Metropolis. *Indonesian Journal of Multidisciplinary Research, 2(2*), 257-264.

Bolaji, H. O. & Jimoh, H. A. (2023). Usability and utilization of ICT among educational administrators in secondary students in public school. *Indonesian Journal of Educational Research and Technology*, *3*(2), 97-104.

Collins, A. & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America*. New York: Teachers College Press.

Danner, R. B. & Pessu, C. O. (2013). A survey of ICT competencies among students in teacher preparation programmes at the University of Benin, Benin City, Nigeria. *Journal of Information Technology Education: Research*, *12*(1), 33-49.

Hilty, L. M. & Aebischer, B. (Eds.). (2015). *ICT innovations for sustainability* (Vol. 310). Cham: Springer International Publishing.

Mustapha, M. & Oladimeji, R. M. (2021). An appraisal of the role of information and communication technology in teaching and learning process in Kwara state college of education, Ilorin, Nigeria. Al-Hikmah Journal of Education, 8(1), 343-350.

Olelewe, C. J. & Okwor, A. N. (2017). Lecturers' perception of interactive whiteboard for instructional delivery in tertiary institutions in Enugu State, Nigeria. *Journal of computers in Education*, *4*, 171-196.

Oyeronke, A. & Fagbohun, M. (2013). An assessment of computer and ICT skills among secondary school teachers in Ota Ogun State. *Library Philosophy and Practice (e-journal)*, 846.

Sayfullayeva, D. A., Tosheva, N. M., Nematova, L. H., Zokirova, D. N. & Inoyatov, I. S. (2021). Methodology of using innovative technologies in technical institutions. *Annals of the Romanian Society for Cell Biology*, 7505-7522.

Tam, H. L. Chan, A. Y. F. & Lai, O. L. H. (2020). Gender stereotyping and STEM education: Girls' empowerment through effective ICT training in Hong Kong. *Children and Youth Services Review, 119*, 105624.

United Nations Educational Scientific and Cultural Organization. (2013). *International ICT Literacy Panel 2002 Digital Transformaton.* UNESCO.

Wagenaar, R. (2014). Competences and learning outcomes: a panacea for understanding the (new) role of Higher Education?. *Tuning journal for higher education*, *1*(2), 273-302.