

SENIOR SECONDARY SCHOOL TEACHERS' COMPETENCE ON THE USE OF ICT TOOLS FOR TEACHING BIOLOGY IN ILORIN METROPOLIS

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Abstract

Information and Communication Technology (ICT) is commonly used as an umbrella term for a wide collection of computer based instruments, resources, environments, procedures, and skills used for obtaining, processing, and communicating information. ICT can be used to analyze educational problems, stimulate students' learning, enrich the quality of instruction and improve teachers' competence anywhere in the world. ICT has been integrated in to the field of education but it has not fully been implemented in Nigeria secondary schools. This study: i. determined Secondary school teachers' competence on the use ICT tools for teaching Biology; and ii. examined the influence of gender on Secondary school teachers' competence on the use of ICT tools for teaching Biology. The study was a descriptive research design of the survey type. The study randomly sampled 200 Biology Secondary school teachers in 6 purposively selected Secondary Schools in Ilorin metropolis. A researcher-designed questionnaire was employed for the study. Mean and standard deviation values were used to answer the research question, while t-test was used to test the only hypothesis at 0.05 level of significance. Findings of this study revealed that: Secondary school teachers had high level of competence on the use of ICT tools for teaching Biology with mean score of 3.16 using a benchmark of 2.5 and there was no significant difference on secondary school teachers' competence on the use of ICT tools for teaching Biology based on gender. The study concluded that secondary school teachers had high competence level on the use of ICT tools for teaching Biology. This implies that secondary school teachers are competence on the use of ICT tools for teaching Biology in Ilorin metropolis.

Keywords: Competence, ICT Tools, Teachers

Introduction

The world is fast becoming a global village due to the rapid development in Information and Communication Technology (ICT). The most important tool used in the globalization is the computer. Moursund & Bielefeld (1999) posited that ICT are computer based tools used by people to work with Information and Communication processing needs of an organization. It covers computer hardware and software, the network and other digital devices like Video, Audio, Camera and so on, which transform information (Text, Sound, Motion and so on.) in to digital form. Successful implementation of ICT in the school system depends largely on the competence of teachers towards the impact of modern

technologies in teaching and learning. Kyriakidou, Christomou and Bankzong (2006) stated that experienced teacher, newly qualified and teacher need to be confident in using ICT effectively in teaching. Availability of ICT in schools will not guarantee their effective use irrespective of quantity and quality of technology placed in classrooms, the key to usability of the tools is teacher, therefore, teacher must have competence and right attitude towards technology (Kadel, 2005). The integration of ICT skills for teaching among secondary school teachers has been attributed to work experience, level of education and income (Olsson, Samuelsson, & Viscovi, 2016). Moreover, looking from a life course perspective, it has been established that older people cannot be depicted as generally being hesitant to adopt, opposed to or lack competence with regards to the use of ICT skills. They have, in fact, throughout their lives time encountered many different types of media technologies, platforms and institutions, which they have come to know and adapt into their everyday lives (Blaakilde, 2017). This understanding is typically coupled with a marked worry that lack of digital skills and access will isolate older adults and hinder their full participation in society (Siren & Knudsen, 2017).

Fewer schools in Nigeria still use traditional pattern of education without incorporating ICT and it has generally remained extensively unchanged with regards to traditional teaching methods, most especially in secondary schools in Nigeria (Kadel, 2005). The use of ICT as a tool for enhancing students' learning, teacher's instruction and as a catalyst for improving access to quality education in formal and non-formal settings has become a necessity. Most countries have used the privilege of ICT to transform the structure of education programmes at all levels in the area of disseminating instruction for learning. The use of ICT in schools has widened accessibility to quality education and improve the management of education systems. Major ICT competence required by teachers were highlighted by Kurschner & Woperies (2003) to include: competence in the mastery of a range of educational paradigms, in making use of ICT as minds tools, as a tool for assessment and in understanding the policy dimension of its use for teaching and learning.

Marija and Palmira (2007) classified ICT competence in to two: basic and educational ICT competencies. These competencies are further elaborated in the ICT competence standards for teachers developed organization. Based on these documents, the ICT competence is comprehensive than focus on ICT skills. Rather, it is a comprehensive approach to education reform in six broad area of policy,

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curriculum and assessment, pedagogy in the use of technology, school organization and administration and teacher professional development. The UNESCO (2008a, 2008b) standards for teacher are meant to improve teachers practice in using ICT in an innovative way for teaching, collaborating with colleagues and for school organization. Jegede and Owolabi (2005) opined that gaining an appreciation of teachers' attitude and perceived competence on the use of ICT tools may provide useful insight in to the future of technology integration, acceptance and usage in teaching and learning process in Nigeria schools. Skills oriented model essentially supplements traditional explanatory patterns of class room activities and does little to cultivate the use of ICT as high order thinking and learning tools.

The Nigerian National Policy on Education FRN (2010) aimed at enhancing and improving the competence of teachers in the development and promotion of effective use of innovative materials in schools. This affirms that the nation appreciates that competence of the teaching workforce is a key factor in its sustainable development. Emerging information communication technologies are defining competence of teachers and changing both the educational system and classroom structure. Use of ICT is sine qua non for any individual or organization to function effectively in this age of knowledge economy.

It was observed by Adeyemi (2007) that the greater the relevant experience in a given field or performance of an act, the easier will be the learning of fresh ideas in that particular field or performance of related action. Adeyemi (2007) reported that schools having more teachers with five years and above teaching experience achieve better results than schools having more teachers with less than five years teaching experience likewise academic qualification and subject specialization may also influence the competence of teachers in ICT.

Teachers with high educational qualification and specialization in science related subjects are expected to be more competent in ICT use than teachers with lesser educational qualifications or specialization in humanities, presumably because science, like computer deals with quantitative analysis and requires manipulation of technologies than humanities (Adeyemi, 2007). Namatovu (2011) observed that most teachers are ICT literates and had mastered necessary ICT skills but lack attitude and motivation to fully integrate ICT in teaching. Busari (2003) found out that about half of the respondents in his study on computer use had the ability to use computers. Yusuf (2005) concluded that

most teachers in Nigeria do not have the needed experience and competence in the use of computers either for educational or industrial purposes. In this regard, a particular attention should be paid to the level of ICT competence of secondary school teachers in Nigeria.

Research Questions

what is secondary school teachers' competence level on the use of ICT tools for teaching Biology?

Research Hypothesis

H₀₁: There is no significant difference on secondary school teachers' competence levels on the use of ICT tools for teaching Biology based on gender.

Methodology

The study adopted a descriptive research design of the survey type. This is because survey is usually used to cover large population. A total of 200 teachers were randomly sampled among Biology secondary school teachers in 6 purposively selected Schools in Ilorin metropolis. The research instrument used for this study was a researcher-designed questionnaire titled assessment of teachers' competence on the use of ICT for teaching. The questionnaire was structured in a clear and simple language to enable teachers provide relevant answers to the questions based on their personal views. The questionnaire items were constructed to specifically reflect the research question for the study. The questionnaire was divided into two sections A and B. Section A contained demographic data; while section B obtained responses from teachers on their competence on the use of ICT tools for teaching with response mode of Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)". Mean and standard deviation values were used to analyze and answer research question, while *t*-test was used to test the only hypothesis at 0.05 level of significance.

Results and Discussion

A total of 200 copies of questionnaire were distributed to teachers at six secondary schools in Ilorin, Kwara. However, 150 were returned as valid and thus amounting to about 75% response rate and 100 copies of questionnaires were found usable.

Table 1: Respondents' Percentage Distribution Based on School

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S/N	Name of Schools	Frequency	Percent
1	ANSARU ISL	19	20.88
2	CHAPEL S.S	12	13.19
3	GDSS ALORE	16	17.58
4	GGDSS PAKATA	17	18.68
5	SOCRATES COL	17	18.68
6	ST.ANTHONY	10	10.99
Total		91	100

Table 1 reveals that, nineteen (19) respondents which is 20.88% were from Ansarul Islam Secondary school, twelve (12) respondents which represents 13.19% were from chapel S. S, sixteen (16) respondents which represents 17.58% were from Government Day Secondary School, Alore, seventeen (17) respondents 18.68% were from Government Day Secondary School, Pakata, seventeen (17) respondents 18.68% were from Socrates College while ten (10) respondents which represents 10.99% were from ST. Anthony. The data collected, therefore reveals that Ansarul Islam Secondary school has the highest number of respondents.

Research Question One: what is secondary school teachers' competence level on the use of ICT tools for teaching Biology?

In order to determine secondary school teachers' competence level in the use of ICT for teaching, data were collected from the respondents based on items that expressed their competence in the use of ICT for teaching. Mean was used to analyze data collected, while the grand mean was used to determine the overall secondary school teachers' competence level in the use of ICT for teaching based on a benchmark of 2.5 mean score. The results are as shown on Table 2.

Table 2: Respondents' Competence level on the use of ICT tools for Teaching Biology

S/No	ICT competency level of the secondary school teachers	Mean
1	I have thorough knowledge of using ICT tools to teach Biology	3.34
2	I am comfortable teaching with ICT tools	3.1
3	I am proficient in the use ICT tools for teaching Biology	3.07
4	I am good at File navigation	2.7
5	I do make use of word processing and PowerPoint in an excellent ways for teaching	3.02
6	I use ICT tools at the level of student when teaching in class room	3.47
7	I do lead students to discover fact when using ICT tools for teaching.	3.35
8	I have excellent knowledge of using email and internet	3.2
Grand Mean		3.16

Table 2 revealed secondary school teachers' competence level in the use of ICT for teaching, as item 1 with a mean score of 3.34 revealed that respondents have thorough knowledge of using ICT to teach. Item 2 with a mean score of 3.10 agreed that respondents are comfortable teaching with ICT tools. With a mean score of 3.07 which is above the benchmark score, item 3 agreed that respondents are proficient on the use ICT tools for teaching Biology. Items 4 with mean scores of 2.70 which is slightly above the bench mark, agreed that respondents are good at File navigation. Item 5 with a mean score of 3.02, revealed respondents' agreement that they do make use of word processing and Powepoint in excellent ways for teaching Biology.

Item 6 with a mean score 3.47 revealed that respondents use ICT tools at the level of student when teaching in class room. With a mean score of 3.35, item 7 revealed that respondents did lead students to discover fact when using ICT tools for teaching. Item 8 with a mean score of 3.20, revealed that respondents had excellent knowledge of using email and internet. Hence, using a benchmark of 2.5, it can be concluded that secondary school teachers have competence on the use of ICT tools for teaching Biology.

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Ho₁ There is no significant difference between secondary school teachers competence on the use of ICT tools for teaching based on gender.

Table 3: *t*-test Analysis on Male and Female Secondary School Teachers' Competence in the Use of ICT for Teaching.

Gender	N	X	SD	df	t	Sig	Remarks
Male	35	25.03	3.56	89			
					-0.59	0.56	Not Rejected
Female	56	25.39	2.37				
Total	91						

According to Table 3, df (89) $t = -0.59$, $p > 0.05$. That is, the result of t -value of -0.59 resulting in 0.56 significance value was greater than 0.05 alpha value. This means that the stated null hypothesis was not rejected. This implies that the hypothesis which states that there is no significant difference between secondary school teachers' competence on the use of ICT tools for teaching Biology based on gender is not rejected.

Discussion of Findings

This study assessed secondary school teachers' competence on the use of ICT for teaching in Ilorin Metropolis and it was examined in research question 1. It was revealed that secondary school teachers had competence on the use of ICT for teaching. This is in agreement with a research by (Kadel, 2005) Availability of ICT in schools will not guarantee their effective use irrespective of quantity and quality of technology placed in classrooms, the key to usability of the tools is teacher, therefore, teacher must have competence and right attitude towards technology. ICT are seen to be an instrument that facilitates learning and enhances learning. It is of note that teachers of nowadays have the knowledge of ICTs, how to create using ICTs, a new learning environment and are also concern of the change that is expected in the teaching (teachers becoming a collaborators) and are still doing their best to be more updated about the effective use of ICTs . It is also in line with Namatovu (2011) who observed that

most teachers are ICT literates and had mastered necessary ICT skills but lack attitude and motivation to fully integrate ICT in teaching

Findings of this study on the influence of gender on secondary school teachers' competence in the use of ICT for teaching revealed that there is no gender difference in the teachers' competence when using ICT for teaching. By implication, this means that gender has no influence in teachers' competence in the use of ICT for teaching. Therefore, ICT tools need to be made available, orientations and trainings in the use of ICT tools for teaching should be accorded to teachers across all gender.

Conclusion

This study assessed secondary school teachers' competence on the use of ICT tools for teaching Biology in Ilorin Metropolis. The result obtained from the data gathered and analyzed indicated that secondary school teachers had competence on the use of ICT tools for teaching Biology. The findings also showed that there was no significant difference between male and female teachers' competence on the use of ICT tools for teaching Biology.

Recommendations

On the basis of the findings, the following recommendations were made: Biology Teachers should be encouraged to continue utilizing ICT tools for teaching to improve their competence in the integration of ICT tools for teaching.

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