Nigerian Online Journal of Educational Sciences and Technology (NOJEST)

Volume 1, Number 1, 2020

NIGERIAN ONLINE JOURNAL OF EDUCATIONAL SCIENCES AND TECHNOLOGY (NOJEST)

http://ujh.unilag.edu.ng

NIGERIAN ONLINE JOURNAL
OF
EDUCATIONAL SCIENCES
AND TECHNOLOGY

BIOLOGY TEACHERS PERCEIVED USE OF INFORMATION COMMUNICATION TECHNOLOGY FOR INSTRUCTIONAL ACTIVITIES IN SECONDARY SCHOOLS IN NIGERIA

Abidoye, F. Omosholape[1] & Adeyemi, C. Oluwakemi[2]
Department of Science Education University of Ilorin, Ilorin, Nigeria[1]
Federal College of Education (Special) Oyo[2]
abidoye.fo@unilorin.edu.ng

To cite this article:
Abidoye, F. O & Adeyemi, C. O (2020). Biology teachers perceived the use of information communication technology for instructional activities in secondary schools in Nigeria. *Nigerian Online Journal of Educational Sciences and Technology (NOJEST)*, 1 (1), 99-106

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Abidoye, F. Omosholape[1] & Adeyemi, C. Oluwakemi[2]

Article Info

Article History

Received:
02 February 2020

Accepted:
22 April 2020

Keywords

Biology Teachers, Perceived Use, ICT, Instructional Activities

Abstract

This study examined Biology Teachers' perceived use of Information Communication Technology (ICT) for instructional activities in Secondary Schools in Nigeria. The target population for the study was all biology teachers in Nigeria, Five hundred and forty-four secondary schools are in Kwara state, thirty-three where all the number of senior secondary schools in Ifelodun which were purposefully selected. The researcher designed teachers' questionnaire which was administered to one hundred and two (102) teachers selected from thirty-three (33) secondary schools in Ifelodun. Researcher-designed validated questionnaire was used to elicit information from the respondents on the teachers' perception towards the use of ICT in Biology teaching. Three research questions were answered and two hypotheses were tested. Percentage and t-test statistics were used to analyze the data collected. The finding of this study revealed that Biology teachers perceived the use of ICT for Instructional Activities in teaching Biology was significant. It was revealed that there were no significant differences in Biology teachers' perceived use of ICT for Instructional Activities in teaching Biology based on gender but not significant on experience. Based on the findings of this study, it is hereby recommended that; ICT Education should be compulsory in all secondary schools in Ifelodun *LGA Kwara State to improve more in Biology teaching, the Teacher Registration Council of Nigeria should provide ICT for both the male and female Biology teachers, there should be an opportunity to be ICT literate through in-service education for Biology teachers especially the less experience Biology teachers.*

Introduction

Science is the great enterprise which nations depends on; for technological advancement. Science is both a process (scientific method) and a product of (knowledge, fact and principle) (Ezeh, 2013). The process and product of science are acquired through education and this is a specialized type of education. Science plays important roles in our society because it relates to our daily life and career. Science is a systematic process of obtaining testable knowledge about nature and natural occurrence, utilizing careful observation and experimentation (Okeke, 2007). The importance of science in our society made the federal ministry of education to introduce science subjects in the nation's secondary school curriculum. Biology is one of such subject introduced

Biology is the study of life and structure of living things. Biology is the study of living things and concerns itself with the study of the structural, behaviour, distribution, the origin of plants, and animals and their relationship with their environment (American heritage of the English

language 2009). Biology deals with the study of all the varied aspects of living organisms. It is one of the science subjects, offered by candidates sitting for the senior school certificate (SSC) ordinary level examinations. Biology is the most popular subject among pure science subjects (Idodo, 1996).

Biology is one of the science subjects that deal with the study of living things, it is the attempts to understand the teeming diversity of life on earth and diversity of level we are all part of life (Adegbite, 2005). Abidoye (2015) stated that biology is natural science in which we study living organisms, plants and animals. The knowledge of biology helps in checking environmental degradation such as desertification, erosion, water hyacinth, land, air and water pollution. Biology is one of the sciences that deal with the study living things, for attempts to understand the teeming diversity of life.

Shedd (2004) examined the incorporating technology in the classroom and the findings suggested that anyone preparing to become teachers must incorporate technology into their class when teaching. To become great in Nigeria we must first need to change our method of teaching and learning of science education from the traditional way of talk and chalk method and reading by carrying books around as the world is changing towards Information and Communication Technology (ICT). The world is in the era of Information and Communication Technology (ICT) where information is not restricted by time, space and channel. The world is in the era of where ICT information is not restricted by time, space and channel (Ajayi & Ojo, 2010). Ajayi and Ojo (2010) observed that for science teachers to be effective in teaching they have to make use of ICT. There must be a determination for the use of the ICT in teaching, the moderating variables such as the gender, years of teaching experience and school type was determined.

Abiri and Ugborugbo (2008) undertook a study on an examination of genders' influence on teachers' productivity of secondary school in Delta State, Nigeria. The study was descriptive and involved 979 teachers made up of 460 males and 519 females. Two sets of questionnaires and a rating scale were used to collect data for the study. The results revealed that there was no significant difference in the productivity of male and female teachers, the male teachers were generally more productive than their female counterparts but the female teachers were more influenced by location than the male teachers.

Udousoro (2012) viewed the effect of gender and Mathematics ability on academic performance of students in chemistry. The sample size comprises of 100 SS1 Chemistry students in two secondary schools in Oyo metropolis. The instruments used were the chemistry achievement test (CAT) and the Mathematics ability test (MAT). Independent t-test statistics tools were used to analyze the data collected. The results of the test indicated that gender does not have any significant effect on the academic performance of students in Chemistry.

Abatan (1991) observed the teacher quality and students' performance in selected *school* subjects in Mushin Local Government Area Secondary Schools of Lagos State. Two variables were compared using the means of percentages and chi-square statistical analysis. The finding indicated that the experience of the teachers influenced the students' performance in Mathematics, English Language, Biology, Physics, Chemistry, History, and Account. This shows that the more experienced, the better the performance of the students. Students taught by experienced teachers performed better than those taught by less-experienced teachers. Hanushek, Rivkin and Kain (2005) observed the market for teacher quality and the result showed that students of experienced teachers achieved better than students of new teachers (those with one to three years of experience). Similarly, in some other studies, teaching experience was found to be related to students' achievement but that the relationship could not be ascertained to be linear.

Objective of the study

This study determined the Biology Teachers' perceived use of Information Communication Technology (ICT) for instructional activities in Secondary Schools in Nigeria

Specifically, the study examined:

1. Biology Teachers' Perceived use of ICT for Instructional Activities in Secondary Schools in Ifelodun LGA, Kwara State, Nigeria
2. Biology Teachers' Perceived use of ICT for Instructional Activities based on gender
3. Biology Teachers' Perceived use of ICT for Instructional Activities based on years of teaching experience

Research Questions

1. How do Biology teachers perceive the use of ICT for instructional activities?
2. How do Biology teachers perceive the use of ICT for instructional activities based on gender?
3. How do Biology teachers perceive the use of ICT for instructional activities based on years of teaching experience**?**

Research hypotheses

Ho_1: There is no significant difference in Biology teachers perceived the use of ICT for instructional activities based on gender.

Ho_2: There is no significant difference in Biology teachers perceived the use of ICT for instructional activities based on years of teaching experience.

Methodology

This research type was a descriptive survey in which data were collected from a sample of individuals from a specific population. The study was an investigative survey method to explore the Biology Teachers' Biology teachers perceived the use of ICT for instructional activities in Nigeria. The sample and sampling technique was target population for the study which involved all biology teachers in Nigeria, Five hundred and forty-four (544) secondary schools are in Kwara state, thirty-three (33) where all the number of senior secondary schools in Ifelodun which were purposefully selected. The target population was Biology teachers from selected senior secondary schools in Ifelodun LGA. One hundred and two (102) Biology teachers were randomly selected for the study. The instrument used as a tool was a questionnaire for data collection. It consisted of two sections (sections A and B). Section A of the questionnaire requested for the personal information of the Biology teachers such as; school name, gender and years of teaching experience.

Section B of the questionnaire contained 20 statements representing opposing viewpoints of the perceived objects. The responses to the questionnaire items were based on a four Likert scale such as Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The questionnaire was administered to Biology teachers in the selected schools. The statements in the perceived questionnaire were designed to indicate more or less perceived possessed by the individual respondent. The perceived scale constructed by the investigator was a scale having 20 statements. The procedure for data collection was that the researcher personally visited all the selected schools for the study. In each case, the researcher sought permission from the appropriate authorities. The administration of the questionnaire was done with the help of the Heads of Science Departments in each school. Biology teachers were encouraged to be objective in their responses. The researcher waited and collected the completed copies questionnaire immediately and others that could not be completed were collected after a week.

The data were subjected to descriptive statistics of percentages. Hypotheses 1 and 2 were tested using t-test analysis

Results

Demographic Data

Table 1: *Number and Percentages of Teachers' Responses*

Variable	Number of teachers	Total	Percentage distribution
Male	47	102	46
Female	55		54
Experience	38	102	37
Less –Experience	64		63

Table 1 shows the distribution of one hundred and two (102) respondents involved in the study. One hundred and two (102) respondents were distributed into two variables i.e. gender and experience. There were 47 Male and 55 Female respondents, under experience there were 38 experienced and 64 less-experienced Biology teachers were involved.

Research Question 1

How do Biology teachers perceive the use of ICT for instructional activities?

Table 2: *Biology teachers against items of ICT for instructional activities*

S/N	ITEMS	Agreed	Disagreed	Total
1	ICT should be taught as a separate subject	88(86%)	14(14%)	102
2	ICT should be integrated into Biology teaching	94(92%)	8(8%)	102
3	ICT should be integrated into Biology subject because of curriculum requirements	74(73%)	28(27)	102
4	ICT should be integrated into all the content in Biology several	81(79%)	21(21%	102
S/No	**ITEMS**	**Agreed**	**Disagreed**	**Total**
5	ICT should be integrated into Preparing lessons	84(82%)	18(18)	102
6	The desktop computer without internet Access should be involved in Biology teaching	23(23%)	79(77%)	102
7	Desktop computer with internet Access should be involved in Biology teaching	92(90%)	10(10%)	102
8	Non-internet-connected laptop, tablet PC, notebook or notebook computer should be involved in Biology teaching	31(30%)	71(70%)	102
9	Internet-connected laptop, tablet PC, notebook or notebook computer should be involved in Biology teaching	70(69%)	32(31%)	102
10	An E-reader (a device to read Biology textbooks on screen)	89(87%)	13(13%)	102
11	Mobile phone should be provided by the School for Biology teaching	91(89%)	11(11%)	102
12	Interactive whiteboard should be available for Biology teaching	96(94%)	6(6%)	102

13	Digital camera or camcorder Should be available for Biology teaching	82(80%)	20(20%)	102

S/No	ITEMS	Agreed	Disagreed	Total
14	Computer laboratory should be provided by the School for Biology teaching	87(85%)	15(15)	102
15	Student response system (e.g., ActiVote, ActiExpression or other) Should be available	92(90%)	10(10)	102
16	computers and/or the internet should be available for biology teaching	94(92%)	8(8%)	102
17	ICT should be used Biology Class teaching in front of/with the Students	96(94)	8(8%)	102
18	ICT computers should be often used and/or the internet in Biology classes	83(81%)	19(19%)	102
19	Projector Should be made available in the school for Biology teaching	93(91%)	09(9%)	102
20	Multi-choice centre make Biology teaching to be easier	91(89%)	11(11%)	102

The results of the analysis related to this question are as shown in table 2. According to the information in table 2, it can be observed that all of the respondents views on the use of ICT for instructional activities in a secondary school in Nigeria. This assertion is derived from responses to the outlined in 1 to 20 items. For item one (1) most of the respondents agreed 86%, while 14% disagreed with the stamen. For item 2 it indicated that 92% agreed, while 8% disagreed also item 3, their responses showed that 73% agreed, while 27% disagreed. In the same vein, response to item 4 indicated that 79% agreed, while 21% disagreed. The same trend was observed in the remaining statements. However, the general responses to the items were 80% agreed, while 20% disagreed. These show the view of Biology teachers perceives the use of ICT for instructional activities in Secondary School.

Research Question 2:
How do Biology teachers perceive the use of ICT for instructional activities based on gender?

Table 3: *Biology teachers perceived the use of ICT for instructional activities based on gender*

Gender		Mean	SD	t-value	df	p-value
Male	47	63.35	4.6	68.55	101	0.85
Female	55	82.62	6.8			

Table 3 shows that the mean scores for male were 63.35 and for female was 82.62 and that no significant difference existed between the score of male and female Biology teachers perceived the use of ICT for instructional activities based on gender since the p-value (0.85) > 0.05. The null hypothesis 1 (Ho_1), which states that there is no significant difference in the Biology teachers perceived the use of ICT for instructional activities based on gender, is not rejected.

Research Question 3:
How do Biology teachers perceive the use of ICT for instructional activities based on years of teaching experience**?**

Table 4: *Biology teachers perceived the use of ICT for instructional activities based on their Year of Experience*

Experience	**N**	**Mean**	**SD**	**t**	**df**	**p-value**
experience (0-5)	38	81.53	6.3	2.6	101	0.04
Experience 6years above)	64	83.65	6.8			

Table 4 shows the mean scores and indicated that there was a significant difference between the experienced and less experienced Biology teachers perceived the use of ICT for instructional activities in Nigeria based on years of teaching experience since the p-value (0.04) < 0.05. The mean scores range between 81.53 and 83.65. The null hypothesis 2 (Ho_2), which states that there was a significant difference in Biology teachers perceived the use of ICT for instructional activities based on years of teaching experience, is rejected.

Discussion
Biology teachers had a positive perception of the use of ICT in Biology teaching. This may be because they play an important role in imparting the knowledge and equipping the students to be useful to themselves and society. This finding is in agreement with the findings of Abidoye (2015) that examined the influence of Gender and Academic Performance on the perception of Biology teachers on the teaching of Ecology in Secondary Schools and reported a significant difference in the Biology teachers' perception. It was stated in this study that there was no significant difference in the Biology teachers' perception of Biology teaching based on their gender. The males and the female had similar mean attitudinal score; the reason that alluded to this finding may be because male and female science teachers have realized more the importance of Biology teaching for their future. This study was in agreement with the study of Akiri and Ugborugbo (2008) observed an examination of genders' influence on teachers' productivity of secondary school in Delta State, Nigeria. The results revealed that there was no significant difference in the productivity of male and female teachers, the male teachers were generally more productive than their female counterparts but the female teachers were more influenced by location than the male teachers. It was found in this study that there was a significant difference in the Biology teachers perception of Biology teaching based on their years of teaching experience. It may be because the experienced Biology teachers can concentrate on the most appropriate way to teach particular topics to students who differ in their abilities, prior knowledge and backgrounds. This finding is in agreement with the finding of Hanushek, Rivkin & Kain (2005) observed the market for teacher quality showed that students of experienced teachers achieved better than students of less experienced teachers (those with one to five years of experience). The findings showed that a significant difference existed in the experience and less experienced biology teachers.

Conclusion

The study concluded that Biology teachers' perceived using ICT for Biology teaching is positive, gender and experience had a significant influence on the use of ICT for teaching biology.

Recommendations

Based on the findings of this study, it is hereby recommended that Teacher Registration Council of Nigeria should provide ICT for both the male and female Biology teachers and there should be an opportunity to be ICT literate through in-service education for Biology teachers especially the less experience Biology teachers.

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Author Information

Abidoye, F. Omosholape
Department of Science Education
University of Ilorin, Ilorin, Nigeria[1]
abidoye.fo@unilorin.edu.ng

Adeyemi, C. Oluwakemi
Federal College of Education (Special) Oyo