

Biology Teachers' Perception of Integrating Mobile
Phones as Instructional Strategy in Teaching Senior
Secondary School Students in Minna Metropolis, Nigeria

Babagana, M.¹

Idris, U. S. B.²

Chado, A. M.³

Ndagi, M.⁴

Jibril, M. N.⁵

^{1,2, & 3}Department of Science Education, Federal University of
Technology, Minna, Nigeria.

^{4 & 5}Niger State Secondary School Education Board, Minna, Nigeria.

Abstract

This study examined Biology teachers' perception of integrating mobile phone as an instructional strategy in teaching and learning of Biology in senior secondary schools in Minna Metropolis, Niger State. A total of 50 Biology teachers was sampled. In carrying out the research, two research questions and two hypotheses were formulated. The data collected were analyzed using mean, standard deviation and t-test, using Statistical Package for Social Science (SPSS) application version 20. The results indicated that Biology teachers negatively perceived the application of technology into teaching and learning activities in schools, use of mobile phones for teaching and learning of Biology. There was no gender difference in Biology teachers' perception of application of technology in to teaching of Biology;; No gender difference in the Biology teachers' perception of integrating mobile phone as instructional strategies in teaching Biology in senior secondary schools in Minna Metropolis. Based on these findings, it was recommended that government should educate, encourage and provide mobile phones to schools to enhance teaching Biology.

Key Words: Mobile phones, Technology, perception, Biology teachers

male and female Biology teachers' perception of application of technology in to teaching of Biology in secondary schools.

Ho: There is no significant difference between male and female Biology teachers' perception of integrating mobile phones as instructional strategy for teaching Biology in secondary schools.

Methodology

The research design adopted for this study was a survey research in which questionnaire was an instrument developed by the researchers to obtain factual information from Biology teachers. This work investigated Biology teachers' Perception of integrating mobile phone as instructional strategy for teaching and learning of Biology in senior secondary schools in Minna Metropolis. The population used for the study comprised 80 Biology teachers in 25 senior secondary schools in Minna Metropolis. Due to inadequate population, 50 Biology teachers were randomly selected through simple random technique from the population. Eventually, 25 Male and 25 Female Biology teachers were randomly selected for the study. The instrument used for data collection was carefully constructed questionnaire which was developed by the researcher which was

validated by two experts from Science Education Department, F.U.T. Minna. The questionnaire was titled Biology Teachers Perception of Mobile Phone Questionnaire (BTPMPQ) was prepared for the Biology teachers to air their views concerning the integration of mobile phone as instructional strategies for teaching and learning biology in senior secondary schools in Minna Metropolis. The questionnaire designed for the teachers was divided into two sections, section A deals with demography (personal information) while section B deals with sentenced questions (items 1- 28). The questionnaire adopted a Likert-scale method in which the respondents responded to a question by ticking any of the five options (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree). The data were analyzed using mean and standard deviation. 3.00 was used as the criterion for interpretation of the perception. 3.00 and above means positive perception while 2.99 and below means negative perception.

Results and Data Analysis

Research Question one

1. What is perception of Biology teachers on the significance of application of technology in to teaching in secondary schools?

include portability, interactivity, mobility, low cost to mention but a few (Nikou & Economides, 2013). Teacher's perception will be examined based on the influence of gender and their mean response towards readiness and acceptance in the use of mobile technology in the classroom.

Gender has been identified as one of the factors influencing teachers' perception. It is also one of the variables for conducting this study. In order to ensure good communication between teachers and students, it is vital to have good understanding of how different groups may approach the use of ICT / mobile phones. Some studies have shown very significant differences in the use of ICT facilities with regard to gender. Ogunlade (2009) submitted that females are under-represented in school computer course, computer clubs and in computer science based careers and do not spend as much time at home using computers as males do. Hou, Huang and Lin (2006) also stated that females treat computer as devices. Thus, the study indicates that males use technology for fun; while female tend to use it as a means of communication. Males generally achieve better in computer and hold more positive attitude towards computer than their female counterparts. Chukwuemeka (2010) reported that female teachers have inadequate proficiency skills in using internet for teaching and learning process. As for a mobile phone, the gender difference in conventional telephone use seems to have extended to the technology.

Statement of the Problem

The objective of the National Policy on Education (FRN, 2004) is to help students to become intellectual and effective teachers with good mastery of content and method for effective teaching of Biology in senior secondary schools. However, the Chief examiners' report of 2000 to 2007 revealed that only 20% to 30% of the students pass Biology annually. This underachievement in Biology has been attributed to student related factors, teacher

related factors and physical factors of the learning environment. Of these groups of factors, the teacher plays a very important role in creating conducive learning environment that can enhance students' cognitive and affective outcomes. This situation calls for intervention in methods employed by teachers. This has necessitated the need to employ strategies for improved teaching in our schools. The strategy considered in this study for improvement is integration of mobile phones. IMP may be more effective in achieving better learning outcomes and sustain students' achievement in Biology. It is on the above premise that the researchers deemed it necessary to carry out this study to determine the teachers perception on integrating mobile phone as instructional strategy for teaching Biology in secondary schools in Minna, Niger State.

Research Question

The following research questions were raised to guide the study:

1. What is perception of Biology teachers on the significance of application of technology into teaching in secondary schools?
2. What is the Biology teachers' perception of integrating mobile phones as instructional strategy for teaching Biology in secondary schools?
3. Is there any significant difference between male and female Biology teachers' perception of application of technology in to teaching of Biology in secondary schools?
4. Is there any significant difference between male and female Biology teachers' perception of integrating mobile phone as instructional strategy for teaching Biology in secondary schools?

Research Hypotheses

The following null hypotheses were formulated to guide the study:

Ho₁: There is no significant difference between

Table 1 reports Biology teachers' responses on the application and significance of technology in teaching. From the results, the mean response was 2.04 with standard deviation of 0.78. This is below 3.00 criterion, indicating that the teachers are having negative perception on the use of technology in teaching.

Research Question Two

What is the Biology Teachers perception of integrating mobile phones as instructional strategy for teaching Biology in secondary schools?

Table 2: Biology Teachers' Perception of Integrating Mobile Phone in Teaching

S/N	ITEM	MEAN	SD	REMARK
13	I use my mobile phone for my daily communication.	3.25	1.02	Agreed
14	Mobile phones can be used in teaching activities in schools.	2.40	0.94	Disagree
15	Mobile phones influence teacher-students interaction in the class.	2.33	0.80	Disagree
16	Mobile phones stimulate learning.	2.11	1.50	Disagree
17	Mobile phones improve students' skills in research.	1.98	0.75	Disagree
18	Mobile phones simplify teaching when used in the class.	2.23	0.88	Disagree
19	Mobile phones enable teachers to achieve teaching and learning objectives.	1.80	1.02	Disagree
20	Mobile phones improve students' performance when used in teaching and learning.	2.35	0.60	Disagree
	Average mean	2.31	0.94	Disagree

Table 2 reports perception of Biology teachers on integrating mobile phones in teaching activities in schools. From their responses, it is clear that the teachers perceived usefulness of mobile phones as they possess it, but negatively perceived its use in teaching and learning activities in schools with mean average of 2.31,

and standard deviation 0.94. This is below the set criterion of 3.00 mean score.

H_{01} : There is no significant difference between male and female Biology teachers' perception of application of technology into teaching of Biology in secondary schools.

Table 3: t-test Analysis of the Mean Difference between Male and Female Biology Teachers on the Application of Technology in to Teaching in Secondary Schools

Variable	N	df	Mean	SD	t-cal	P-value
Male	25	48	1.01	0.79	1.106	0.117
Female	25		1.03	0.99		

*=Significant at $P= 0.05$

Table 1: Biology Teachers' Perception of Application of Technology in Teaching

S/N	ITEMS	MEAN	SD	REMARK
1.	I'm willing to apply new method of teaching in my school	2.70	1.71	Disagree
2.	Technology helps to facilitate teaching and learning in schools	1.63	0.60	Disagree
3.	Educational technology saves time, energy and money when used	1.92	0.91	Disagree
4.	Educational technology eliminates boredom among students in the class	1.81	0.93	Disagree
5.	Educational technology stimulates students' interest in the classroom	2.33	0.70	Disagree
6.	Educational technology influences holistic learning of concepts	1.52	1.12	Disagree
7.	Incorporating educational technology influences curriculum implementation	2.02	0.80	Disagree
8.	Incorporating educational technology improves teachers knowledge and skills in teaching	1.84	2.00	Disagree
9.	Incorporating educational technology improves teachers performance	1.98	0.94	Disagree
10.	Going for a training on the use use of educational technology will definitely increase my productivity	2.40	0.93	Disagree
11.	Im ever ready to share knowledge of using educational technology with my colleagues	2.36	0.91	Disagree
12.	I'm confident that my performance will improve after learning how to use educational technology in teaching	2.01	0.80	Disagree
	AVERAGE MEAN	2.04	1.78	Disagree

teaching. The result in table 3 indicated no significant difference in the perception of male and female teachers on the application of technology in to teaching and learning in schools $t(48)=1.106$, $P > 0.05$. The second hypothesis sought to find out if there was any significant difference between male and female Biology teachers' perception of integrating mobile phone as instructional strategy for teaching Biology. Table 4 revealed that there is no gender difference, $t(48) = 1.166$, $p > 0.05$, in Biology teachers' perception of integrating mobile phone as instructional strategies in teaching Biology in senior secondary schools in Minna Metropolis. This result is in agreement with the finding of Nixon (2013) who reported that mobile learning perceptions and mobile learning levels of the prospective teachers showed no significant gender difference. It is how ever in contrary with the findings of McKinney, Dyck and Luber (2009), Wang, Wu and Wang (2009), Al Fahad (2009), Çavuş and Biçen (2009), state that male teachers have more positive mobile learning perception than female teachers.

Conclusion

From the result of the research it was found that Biology teachers perceived the use of mobile phone for teaching and learning as encouraging but are not ready to implement it in their teaching. It was also found that gender is not a factor in the perception of biology teachers in the integration of mobile phone as instructional strategies in the teaching of biology in senior secondary schools in Minna Metropolis.

Recommendations

The findings of this study have great implications for teaching and learning of Biology, and the following recommendations were put forward by the researcher:

- (i) Teachers should be enlightened on the significance of the use of mobile phones teaching and learning purposes in schools.

- (ii) Government should provide teachers with affordable phones on loan, if not free for effective utilization in teaching activities
- (iii) The schools should provide and encourage the use of necessary instructional materials and equipment's needed to carry out biology instructions in the school e.g. Audio visuals
- (iv) The school should provide more opportunities for the biology teachers to attend seminars, workshops in-service training and Biology conference to broaden and update their knowledge on application of ICT and educational technologies in to teaching in secondary schools

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Table 3 above displays the t-test results of the mean difference in the perception of Biology teachers on application of technology in to teaching. The result shows that $t(48)=1.106$, $P>0.05$. Hence the null hypothesis was retained. Which means no significant difference between the perception of male and female teachers on the significance of application of technology in

teaching Biology in secondary schools in Minna metropolis.

H₀: There is no significant difference between male and female Biology teachers' perception of integrating mobile phone as instructional strategy for teaching Biology in secondary school in Minna Metropolis.

Table 4: t-Test Analysis Of The Mean Difference Between Male And Female Biology Teachers On Integrating Mobile In Teaching.

Variable	N	df	Mean	SD	t-value	P-value
Male	25	48	1.20	0.58	1.166	0.149
Female	25		1.11	0.36		

*=Significant at $P=0.05$

From Table 4 above, the result present the t-test result between male and female Biology teachers' perception of integrating mobile phones in teaching Biology. The result indicated that $t(48) = 1.166$, $p>0.05$. Therefore, the null hypothesis was accepted, as there was no significant difference between male and female Biology teachers; perception of integrating mobile phone in to teaching of Biology in secondary schools in Minna metropolis.

Discussion of Findings

The purpose of this study was to investigate Biology teachers' perception of integrating mobile phone as instructional strategies in teaching Biology in senior secondary schools in Minna Metropolis.

The first research question stimulated responses on the significance of application of technology in to teaching of Biology as a science in secondary schools in Minna. Table 1 provided the results which indicated that Biology teachers have negative perception on the application, with mean response of 2.04. This reveals lack of awareness of the efficacy of ICT in education amongst teachers as partly hinted by MacCallum, Jeffery and Kinshuk (2014). It also indicates deviance from the current trend in education as reported by Mangal, (2013) who

stated that modern ICT have brought revolution in the field of education, industry, service organization, and telecommunication and various other fields affecting our day-to-day activities. It also shows decline from the assertion of Adegbija and falode (2014) who pointed out that the use of (ICT) has tremendous growth in the recent past because of its significant impact on all areas of human endeavors. The field of education is not left out as technology has positively affected teaching, learning and research in many ways,

The second research question was on the use of mobile phone for teaching and learning. The result indicated negative perception (mean=2.31, SD=0.94) on the use of mobile phones in teaching Biology in secondary schools. The finding was in agreement with MacCallum, Jeffery and Kinshuk (2014) they stated that a large number of lecturers still resist the integration of technology (Mobile phone) into the classroom. Perhaps, the thinking of teachers could have been directed towards the cost and social vices attributed to mobile phones usage nowadays.

The first hypothesis sought to find out the difference between male and female Biology teachers on the application of technology in