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USING MOBILE PHONES TO IMPROVE EDUCATION: A SURVEY OF SCIENCE TEACHERS' ATTITUDES AND PERCEPTIONS IN SECONDARY SCHOOLS IN BICHI EDUCATION ZONE, KANO STATE – NIGERIA

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Abstract: Mobile phones are the fastest media for information dissemination. Their use has changed the style of so many things in the world. Their diverse functions has also made it an indispensable tool necessary for everyday life. Despite the importance of mobile phones, the increasing rate of youth addiction to it is fueling serious concern on students learning. Studies have revealed that poor performance in school subjects are attributed to addiction to phones! There is therefore the need for teachers to utilize the 'addiction' to the advantage of the learners. To change the status quo, this study examined science teachers' attitudes and perceptions towards use of Mobil phones as an innovative devices to support teaching and learning. The study employed descriptive survey research design. Mobile phones are the fastest media for information dissemination. Their use has changed the style of so many things in the world. Their diverse functions has also made it an indispensable tool necessary for everyday life. Despite the importance of mobile phones, the increasing rate of youth addiction to it is fueling serious concern on students learning. Studies have revealed that poor performance in school subjects are attributed to addiction to phones! There is therefore the need for teachers to utilize the 'addiction' to the advantage of the learners. To change the status quo, this study examined science teachers' attitudes and perceptions towards use of Mobil phones as an innovative devices to support teaching and learning. The study employed descriptive survey research design.

Keywords: mobile phone, sample, secondary schools, science teachers, teaching and learning

Introduction

Mobile phones technologies are revolutionary inventions that are booming today. Phone subscription is increasing from a million to billions, with penetrating power of about 97% of the global population (Guha et al., 2015). Many people are using these devices daily. For instance, in Nigeria according to O'Dea (2020) there are over 40million smartphone users and around 170 million mobile subscribers (Okafor, 2020). These statistics indicates that mobile phones technologies are well positioned in Nigeria.

Mobile phone has changed the style of so many things in the world. Its diverse functions has made it an indispensable tool necessary for everyday life. There is no doubt that mobile phones gives numerous opportunities for students to utilize its applications in supporting learning activities. In line with this, Aliyu et al., (2020) reported that, smartphones have a significant role to play in education generally and teaching and learning in particular, as it provides various opportunities and access to learning

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environment and resources. This enables institutions especially in higher learning to develop learner' support as well as learning opportunities in ways which would enhance conventional teaching methods.

Mobile phones have led to the evolution of new paradigm known as mobile learning or m- learning, which is flexible in teaching and learning. It has transformed the education industry from traditional four wall classroom setting and teacher-centered instructions to virtual classroom setting and students' centered instruction (Bello, et al., 2022). Mobile phones have given rise to new opportunity for sharing information access, retrieval and dissemination much easier and available irrespective of locations, time, package and user in today's world. Thus, mobile phones goes beyond voice communication aids, as it provides opportunity to study concepts and experiments in science virtually, which can enhance understanding of the concepts perceived difficult or abstract in science (Rosemary, 2017). These technologies supports science education with new strategies for presenting concepts and processes in science teaching and learning, most importantly those considered difficult (Taber, 2015). Mobile phone presents students with an appropriate learning environment as there are variety of applications that students can use to support learning of science. For instance, Hussain, et al., (2017) reported that, use of M– learning enhanced students' performances and retention in chemistry. It simplify some of the challenges being faced with difficult and abstract scientific concepts. Similarly, Aliyu et al., (2020) reported that smartphones empower students to collect, review, analyze and process data and information which in essence enhance real-world learning. While, Evans (2014) claimed that learners develop positive attitude and interest when learning environment involves audio, video or both than in reading notes and textbooks. The audio-visual tools were observed to be helpful to students especially when they could accessed and used after a class to review current materials at students' pleasure time.

However, despite these importance, improper use of phones and related technologies can negatively impact students' behavior, learning and well-being. Studies (William, et al., 2021) have revealed that poor performance in school subjects, higher rates of academic dishonesty and cyber bullying are attributed to addiction to phones. Thus, increasing rate of youth addiction to mobile phones, is generating much discussion and heated debate in the society. More especially on how to best manage the increasing ubiquity of phones in schools continue to challenge teachers, pedagogical leaders, administrators and policy makers.

Therefore, there is the need for teachers to utilize the 'addiction' to the advantage of the learners. To change the status quo, this study explore science teachers' attitudes and perceptions to the use of Mobil phones in classroom teaching and learning in secondary schools.

Statement of the Problem

Mobile phones are the fastest media for information dissemination. It has changes the style of so many things in the world. The diverse functions have a significant roles in education generally and teaching and learning in particular, as it provides various opportunities and access to learning environments and resources. Although the effects of using mobile phones in classrooms especially in tertiary institutions have been studied extensively, less is known in secondary schools. Research (Issa *et al.*, 2020) showed that, in most secondary schools in Nigeria, teachers and students with possession of these mobile devices utilize them for entertainment (listening to music, chatting on social media sites, etc) which may not have any positive impact on both the teacher and the learner. These improper use of the devices

can negatively impact students' behaviour, learning and well-being. Therefore, the increasing rate of youth addiction to phone is a serious concern on students learning and it requires teachers' attention. Hence, its importance that the mobile devices be incorporated in teaching and learning to stimulate and arouse students' interest to learn effectively, greatly influence their academic performance positively and consequently facilitate delivery of instructions in the classroom. Therefore, the study examines science teachers' attitude and perception to the use of Mobile phones to support teaching and learning in secondary schools.

Objectives of the study

The study assessed teachers' attitudes and perceptions on the use of Mobile phones in teaching and learning. Specifically, the study

1. Assess secondary school science teachers' attitudes on the use of mobile phones in teaching and learning.

2. Assess secondary school science teachers' perceptions on the use of mobile phones in teaching and learning.

3. Identify some challenges of secondary school science teachers' on the use of mobile phones for teaching and learning.

Research questions

The followings research questions were raised for the study;

1. What is the secondary school science teacher' attitudes towards the use of mobile phones for teaching and learning?

2. What is the secondary school science teachers' perception toward the use of mobile phones for teaching and learning?

3. What are the obstacles to secondary school science teachers' to the use of mobile phones in teaching and learning?

Hypotheses

Based on the research questions, the following hypotheses were tested

Ho1: There is no significant difference between male and female secondary school science teachers' perception in the use of mobile phones for teaching and learning.

Ho2: There is no significant difference between male and female secondary school science teachers' attitude towards the use of mobile phones for teaching and learning.

Methodology of the study

The research design employed for the study was descriptive survey research method. The researcher is interested in examining information efficiently and logically in order to come up with useful data.

The population of the study comprises of all senior secondary schools in Bichi education zone. Ninety four of 143 science teachers from the 35 secondary schools participated in the study. Purposive sampling techniques were used to select the schools and the teachers. Only 94 science teachers were purposively selected as representative sample of the population. The instrument used for data collection was Mobile Phone for Teaching Questionnaire (UMPTeQ). The face and content validity of the instrument was determined by two senior lecturers in the school of education, Federal College of Education (Technical), Bichi, Kano state. The completed questionnaires were collected, numbered and subjected to descriptive statistical analysis. The descriptive statistics such as simple percentage, mean, standard deviation were employed to answer the research questions while independent t-test and analysis of variance (ANOVA) were used to test the hypotheses.

All ethical issues such as non-disclosure of the personality of the respondents, non- exposure of the participants to any form or risk, and not compelling or intimidating the participants in any form were strictly adhered.

Results and Discussion

The completed questionnaires were collected, numbered and subjected to descriptive statistical analysis. The data was transformed into tabular form in relation to the appropriate research question raised in the study. The results that emerged from all the data are highlighted and presented below in tabular form.

Responses to each of the questionnaire item/indicator of teacher perception on mobile usage were measured on a Likert scale, ranging from Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD). The Mean (M) scores greater than three (M>3) indicates positive perception and below three (M<3) reflect negative perception while equals to three (M=3) means neutral perception (Kumar, et al., 2010).

The Teachers' Profiles

The teachers' profiles (Table 1) indicates, 66 (70.2%) of the staff were male, while 28 (29.8%) were female and their age ranged between 35 – 60years. The average year of teaching experience of the respondents was found to be 11.7 years.

Table 1: Teachers' profiles

SN	Information	Sex	Frequency	Percentage
1.	Gender	Male	66	70.2
		Female	28	29.8
		Not filled	0	0
2.	Age group	30 – 40	23	24.5
		41 – 50	45	47.9

		51 – 60	25	26.6
		61 – above	1	1.1
3.	Highest qualification	PhD	0	0
		M.Sc. (Hons)	3	3.2
		M.Sc.(ED)	8	8.3
		B.Sc(Hons)	20	21.3
		B.Sc(ED)	51	54.3
		Others	12	12.8
4.	Teaching subject	Biology	43	45.7
		Chemistry	20	21.3
		Physics	7	7.4
		Mathematics	10	10.6
		Computer science	12	12.8
		Others	2	2.1
5.	Years of Teaching experience	< 5 years	16	17.1
		5 - 10years	17	18.1
		11 - 15years	14	14.9
		16 -20years	13	13.8
		21 -25yeats	17	18.1
		26 - 30years	17	12.8
		> 30years	5	5.3
6.	Do you have Mobile phone?	Responses		
		Yes	94	100
		No	0	0

Majority of the teachers 51 (54.3%) have B.Sc (ED) qualification, which indicates requisite qualification for teaching. It's interesting that, all the teachers own mobile phone, irrespective of their subject areas.

Question 1: What is the secondary school science teacher' attitudes towards the use of mobile phones for teaching and learning?

The result (Table 2) shows the attitudes and percentage of teachers towards usability of mobile phones for teaching and learning. Many teachers, 37 (39.4%) and 22 (23.4%) used text messages to notify and contact colleagues very often and often respectively.

Table 2: Attitudes of Teachers Towards the use of Phones for Teaching

SN	Items	Very often	Often	Occasionally	Rarely	Never
1	Sending text messages to alert and communicate with colleagues	37 (39.4)	22 (23.4)	20 (21.3)	4 (4.3)	11 (11.7)
2	Accessing and sending e-mails on subject matter	11 (11.7)	4 (4.3)	13 (13.8)	26 (27.6)	40 (42.6)
3	Downloading materials to store up- to date information for teaching	8 (8.5)	4 (4.3)	5 (5.3)	15 (15.9)	62 (65.9)
4	Watching/sharing videos clips, audios and images on some topics	23 (24.5)	20 (21.3)	21 (22.3)	11 (11.7)	19 (20.2)
5	Chatting using Social media networking e.g. WhatsApp, etc	24 (25.5)	23 (24.5)	16 (17.0)	11 (11.7)	20 (21.3)
6	Reading e- books, articles to gather information on topics to be treated in class	13 (13.8)	9 (9.6)	33 (35.5)	19 (20.2)	20 (21.3)

Note: Figures in parentheses indicates percentages

Similarly, some teachers 24 (25.5%) and 23 (24.5%) use their phones to chat on social media very often and often respectively. While 23 (24.5%) and 20 (21.3%) share images, audios and videos clips of some topics. Most teachers 15 (15.9%) and 62 (65.98%) rarely and never respectively, download subject materials using phones. Similarly, a good number of teachers, 26 (27.6%) and 40 (42.6%) did not use their mobile phones to e-mails since they did rarely and never respectively. Furthermore, only a few teachers 9 (9.6%) and 13 (13.8%) read news, e –books or articles online to gather information on topics to be treated in class for academic purposes very often and often respectively. These indicates teacher' levels of attitudes to the use phones to support education were very weak.

Question 2: What is the secondary school science teachers' perception toward the use of mobile phones for teaching and learning?

Table 3: Science Teachers' perception to the use of Mobile phones in Teaching and learning

SN	Items	SA	A	U	D	SD	M
1.	Improves communication between learners and Teachers	(42.6) 40	(40.4) 38	(8.5) 8	(6.3) 6	(2.1) 2	4.1
2.	Provides learning opportunities irrespective of pace, place and time	(35.1) 33	(41.5) 39	(16.0) 15	(4.3) 4	(3.2) 3	4.0

3.	Provides rich teaching and learning resources at finger tips	(35.1) 33	(39.4) 37	(16.0) 16	(4.3) 4	(4.3) 4	3.9
4.	Saves efforts and time of learners	(24.5) 23	(41.5) 39	(20.2) 19	(10.6) 10	(3.2) 3	3.7
5.	Saves efforts and time of teachers	(15.9) 15	(20.2) 19	(15.9) 15	(18.1) 17	(29.8) 29	2.8
6.	Supports collaborative learning environment	(26.6) 25	(45.7) 43	(21.3) 20	(3.2) 3	(3.2) 3	3.9
7.	Will be accepted by learners	(34.0) 32	(31.9) 30	(22.3) 21	(7.4) 7	(4.3) 4	3.8
8.	Enhances access to information anywhere and anytime	(40.4) 38	(35.1) 33	(17.0) 16	(4.3) 4	(3.2) 3	4.1
9.	Increase participation in class	(12.7) 12	(10.6) 10	(27.7) 26	(31.9) 30	(17.0) 16	2.7
10.	Plays an important role in future science teaching and learning	(34.0) 32	(33.0) 31	(16.0) 15	(11.7) 11	(5.3) 5	3.8

Note: Figure in parentheses indicates percentage

Table 3 shows that, majority of the teachers 40 (42.6%) and 38 (40.4%) strongly agree and agree respectively, that mobile phones can improves communication between learner and teachers (M=4.1). Also many teachers, 33 (35.1%) and 39 (41.5%) perceived use of mobile phones provides learning opportunities irrespective of pace, place and time strongly agree and agree respectively (M=4.0). Similarly, 43 (45.7%) and 25 (26.6%) of teachers agree and strongly agree respectively, that mobile phone supports collaborative learning (M=3.9) and provides rich teaching and learning resources (M=3.9). These findings showed the science teachers perceived high perception on the use of phones in teaching and learning.

Question 3: What are the obstacles to secondary school science teachers' to the use of mobile phones in teaching and learning?

Table 4: Some Obstacles to the use of Phones in Teaching and Learning

SN	Obstacles	SD	D	U	A	SA
1	Poor/unstable internet connectivity	1 (1.1)	2 (2.1)	11 (11.7)	46 (48.9)	34 (36.1)
2	Lack of pedagogical skills	19 (20.2)	13 (13.8)	11 (11.7)	31 (32.9)	20 (21.3)

3	Students' poor attitudes	4 (4.3)	4 (4.3)	10 (10.6)	33 (35.1)	43 (45.7)
4	Lack of constant power supply	4 (4.3)	8 (8.5)	12 (12.8)	37 (39.4)	33 (35.1)
5	High cost of internet subscription	4 (4.3)	8 (8.5)	15 (15.9)	32 (34.0)	35 (37.2)

Responses from Table 4 shows that, majority of the teachers 46 (48.9%) and 34 (36.1%) agree and strongly agree respectively, to the poor/unstable internet connectivity as the one of the obstacle to the use of phones in teaching and learning. Also, a good number of the teachers 31 (32.9%) and 20 (21.3%) agree and strongly agree respectively, to lack of pedagogical skills amongst the obstacles to the use of phones. Similarly, majority of the teachers 43 (45.7%) strongly agreed on students' poor attitudes as the obstacle, 37 (39.4%) agreed to lack of constant power supply, while on the assertion of high cost of internet as an obstacle, the teachers, 32 (34.0%) and 35 (37.2%) responded agreed and strongly agreed respectively. However, half of the teachers 47 (50.0%) disagreed to the lack of phones as an obstacle to teaching and learning. This is not surprise as it can be seen from Table 1, that all the teachers have mobile phones that can be used for teaching and learning.

Hypotheses Testing

Hypothesis 1: There is no significant difference between male and female secondary school science teachers' perception in the use of mobile phones for teaching and learning.

Table 5: Teachers' Perception Towards the use of Mobile Phone for Teaching Based on Gender

Gender	N	Mean	Std	Df	T	Sig.	Remark
Male	66	40.1	5.35	92	3.15	0.23	Not significant
Female	28	45.4	3.64				

The table 5 shows that calculated t-value (t = 3.15) was greater than P- value (P > 0.05). Hence, the hypothesis was accepted. This result means that statistically significant difference does not exist in the perception of secondary school science teachers' on the use of Mobile phones for teaching and learning based on their gender.

Hypothesis 2: There is no significant difference between male and female secondary school science teachers' attitude towards the use of mobile phones for teaching and learning.

Table 6: Teachers' Attitude Based on the Area of Specialization of Gender

Levels	Sum of square	df	Mean square	F	sig.	Remark
Between groups	2116	34	74.24			
within groups	1755	59	35.57	2.11	0.12	Significant
Total	3872					

Table 6 revealed that F = 2.11, df= 93, sig. 0.12 for teachers attitude towards the use of Mobile phone for teaching and learning. This was found to be significant, meaning that there was a significant difference between male and female teacher' attitude towards the use of Mobile phones based on their area of specialization for teaching and learning. The difference is in the direction of the male teachers' attitude towards the use of mobile phones. Since it was established that there is a significant difference on the teachers' attitude, therefore the null hypothesis which stated that there is no significant difference in the teacher' attitude on the use of Mobile phone is rejected.

Discussion of Findings

The study revealed that teachers' attitude and perception towards the use of mobile phones for academic purpose was positive and teachers moderately have access to these facilities which will enhance teaching and learning. But, the result of the study seems to suggest that, teachers were not using mobile phone for teaching and learning as much as one would expect given that the devices are readily available and accessible.

This study revealed that, teachers 46 (48.9%) and 34 (36.1%) agree and strongly agree respectively, that poor /unstable internet connectivity is the challenge to the use of phone for education purposes in the area. Other teachers, 37 (39.4%) agree on lack of constant power supply, while 32 (34.0%) and 35 (37.2%) agree and strongly agree respectively, on high cost of internet access as the challenge. This may be attributed to the fact that the schools are in the rural areas, where these services are grossly inadequate. The result is in accord with Bello *et al.,* (2020) that, lack of internet connectivity was perceived to be the major obstacle to integration of m-learning in classroom instructions.

The study is not different to what Aliyu, *et al.,* (2020) reported that, the classrooms that are supposed to be a fun and entertaining environment with technologies become unrealistic due to limited power supply to charge a mobile phone in the classroom. These also accompanied with crowded nature of the classes which makes it difficult to implement the use of smartphones in classes. Furthermore, this study revealed teachers 33 (35.1%) and 43 (45.7%) perceived poor students attitudes among the challenges to the use phones in secondary schools. This was endorsed by Williams *et al.,* (2021) that the presence of phones and related technologies in classrooms could detract student's academic performances while contributing to higher rates of academic dishonesty and cyber bullying. These behaviors reflects at least in part, the feeling among teachers for whom the technologies are interesting but involve more work, which is not compatible with their difficult financial situation and long working hours. These

revelations may probably be the reasons for the teachers' reluctant attitudes on the use of phones to support teaching in the schools.

Some of the teachers' discomfort in this was revealed in theirs responses to the; use of phones to saves teachers efforts (M = 2.7) and increase participation in class (M = 2.8) where the mean scores were below three (M<3) which reflects negative perceptions. However, it's interesting to note that, majority of the teachers were aware of the possibilities that comes with using mobile phones in education, as the study indicated 37 (39.4%) and 22 (23.4%) teachers calls and sent text messages to alert and communicate with colleagues on academic issues very often and often respectively. Similarly, the overall data of teachers' perceptions (aggregate means of perception statements; M = 3.72) indicates positive perceptions on the use of mobile phones in teaching and learning. Moreover, the teachers perceived that, mobile phones plays an important role in future science teaching and learning (M = 3.8). These revelations may be attributed to the influence of the teachers' level of digital literacy acquired during their teacher education programs.

The hypothesis test also established no significant difference between male and female science teachers' perception on the use of Mobile phone for teaching and learning. This could also be attributed to the knowledge and skills acquired probably from professional colleagues, seminars, conference/workshops on using modern technological tools in teaching and learning. Thus, influenced their perceptions and attitude on the use of mobile phones. This study therefore, implies that, science teachers have high positive perceptions of the use of mobile phones in secondary schools to leverage students' achievement in education. This shows that Secondary School science teachers could influence attitude and perception in the use of mobile technologies for teaching, if the challenges observed are removed. The science teachers will utilize the addiction of mobile phones technology to the advantage of the learners in classroom instructions in secondary schools.

Conclusion

The use of Mobile devices is changing classroom instructions in several ways. Finding the right balance for the use of phones in secondary schools is a daunting challenge. Some educators believe that phones can be used to enhance and boost instruction, while others fear that the negative effects of their use in class clearly outweigh the potential benefits. The study explored teachers' attitude and perception in the use of mobile devices for teaching in Bichi education zone, Kano State.

The result obtained from data gathered and analyzed in this study indicated that the attitude and perception of the teachers are positively moderate. There was no significant difference in the teachers' perception on the use of mobile technologies for teaching based on gender. While significant difference exited between Secondary Schools Teachers' Attitudes on the use of Mobile phones for Teaching based on gender. Furthermore, it was concluded that poor internet connectivity is among the obstacles to the integration of mobile phone in classroom instruction. The result of this study could enhance the use of mobile technologies for teaching in Nigeria secondary schools.

Recommendations

The following recommendations were made in line with the findings from this study:

1. Policies should be provided on how to manage the use of phones in secondary schools.
2. Teachers should be updated with pedagogical skills of using phones to support teaching and learning.
3. School managements should provide regular power supply, internet access at a cheaper rate to teachers and students within the school compound
4. There is a need for further research on secondary school students' perceptions and the management of mobile phones into class instructions.

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Declaration

All ethical issues such as non-disclosure of the personality of the respondents, non- exposure of the participants to any form or risk, and not compelling or intimidating the participants in any form were strictly adhered.

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