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Teachers' Attitude towards Integration of Information and Communication Technology and its Influence on Students' Performance in Gezawa, Nigeria

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Abstract

Many countries around the world have fully integrated Information and Communication Technology **(**ICT) into their educational systems. The expansion of ICT use in educational settings has sparked a rush of research work examining the link between ICT and academic performance. In Nigeria's education sector, ICT is integrated in secondary school's syllabus. However, their use in teaching and learning has remained sporadic. This paper sought to determine teachers' attitude towards integration of ICT in teaching and learning and their influence on students' performance. The hypothesis tested was there is no significant relationship between teachers' attitude towards integration of ICT in teaching and learning and students' performance. The Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh, Davis, and Morris (2003) were used to guide the study. The sample size consisted of 152 teachers from 16 schools. Questionnaires for teachers and document analysis for students were used to collect data in this study. Descriptive statistics included frequency counts, percentages, means and standard deviation, whereas inferential statistics involved Pearson Product Moment correlation coefficient, factor and multiple regression analysis. The results of the study revealed a weak positive relationship ($r=.178$, $p<.05$) between teacher's attitude towards ICT integration and student's performance, although it is weak, the relationship was significant at .05. It can be concluded that teachers' attitude on ICT integration were positive for students' performance. It is recommended that ICT awareness and integration strategies should be prioritized by school managers to arouse and maintain positive staffs' attitudes and ensure utilization of available resources as they were significant for students' performance. This would help secondary schools in their long-term, continuous efforts for the integration of ICT and its improvement thereby raising students' performance.

Keywords*: Integration, ICT, Attitude, Teachers, Performance*

1.0 Introduction

Information communication technologies (ICT) have the power to significantly improve education, accelerate skill development, engage, fascinate, and motivate students in the learning process, help them connect their school experiences to their work habits, contribute to the economic viability of tomorrow's workforce, improve teaching and course design, and provide opportunities for students to engage with the world in all its forms (Davis & Tearle, 2019). Information and communication technologies (ICTs) may boost the school's efficiency and productivity, resulting in a variety of tools to assist and lift professional action and activities of teachers and instructors (Kirschner & Woperies, 2013). Culp, Honey, and Mandinach (2013) proposed that technology is typically used as (a) a tool to address problems in teaching, learning and instruction. (b) a catalyst for transformation, and (c) a key driver for competitiveness in the marketplace and economy.

In Nigeria's education sector, there have been some changes that show that ICT is being employed in secondary schools. However, despite enormous investment in resources and training, secondary schools are still far behind the curve in using ICTs in science teaching, learning and instruction (Machin, McNally and Silva, 2017; Eteokleous, 2018). This paper sought to find out teachers' attitude towards integration of ICT in teaching and learning, and their influence on students' performance in public secondary schools of Gezawa area in Kano State, Nigeria.

1.1 Statement of the problem

A number of teachers in African countries have not incorporated ICT in teaching and learning (Tedla, 2012). Nigeria has advocated for and pursued technological growth, but the results have been both unsatisfying and encouraging (Adedayo, 2018). Despite the obvious importance of ICT in education, as well as massive capital investments by both the Federal and State governments through ICT-driven projects such as "school net" (Okebukola, 2014 and Adomi, 2016) as well as donations from non-governmental organizations to Nigerian secondary schools, their use in teaching and learning has remained sporadic. When ICT is integrated into teaching and learning, students can learn on their own and do much better (Valasidou & Bousiou, 2015). On the contrary, Leuven et al. (2014) claim that there is no evidence to demonstrate the relationship between increased educational use of ICT and students' performance. In fact, they find a consistently negative and marginally significant relationship between use of ICTs and student performance. In addition, some students may use ICT to increase their leisure time and have less time to study.

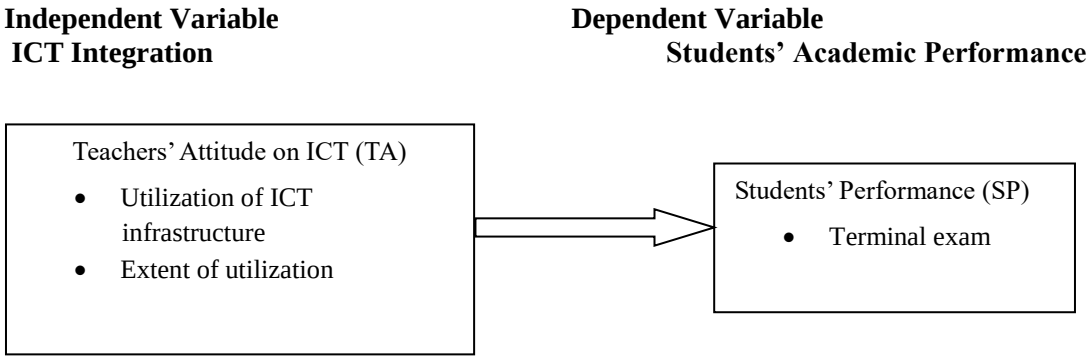
Due to this contradiction, the paper discusses teachers' attitude towards integration of ICT in teaching and learning, and their influence on students' performance in public secondary schools of Gezawa Area in Kano State, Nigeria.

1.2 Theoretical framework

Venkatesh et al., (2003) define Performance expectancy (PEx) is defined as a person's belief that using the system will assist him or her improve his or her performance and so improve the quality of his or her job. The theory's characteristics were used in this study to explain why some teachers employ ICT in their teaching and learning assignments while others do not. Factors that aid or obstruct ICT integration in secondary schools teaching and learning can be explained, shown, and accounted using UTAUT theory. The theory also aids educators in identifying characteristics that make ICT integration in teaching and learning to become potentially more appealing to users. Rodgers (2011) reported that, the pace of adoption of a new technology is determined by the communication channels used to spread news about it and the nature of society. The theory was chosen for this research because it emphasizes the viewpoints and elements that influence ICT integration in secondary school teaching and learning.

1.3 Conceptual framework

Figure 1.1



2.0 Literature Review

2.1 Attitude of Teachers towards integration of ICT in teaching and learning

It's critical to consider how teachers feel about incorporating ICT into teaching and learning because this has a significant impact on how well ICT is used in educational settings (Selewyn, 1999). This is reinforced by Rhoda and Gerald (2000), who noted that effective ICT integration in teaching and learning depends on having a favorable attitude about using ICT. To ensure that the technology integration is successfully carried out in the curriculum of the school as well as during teaching and learning, it is crucial that school teachers have positive attitudes about the use of ICTs, thus, teachers' views are influenced by how they view the value of ICT, how they intend to

behave, and pedagogical factors, also, several factors affect teachers' views on utilizing ICT in teaching and learning (Amuko, Miheso and Ndethiu, 2015).

Factors that can influence the teacher attitude towards ICT include ICT related knowledge and skills, and motivation to use ICT. Successful ICT integration into teaching is influenced by the attitudes and beliefs of the teachers (Keengwe, Onchwari and Wachira, 2008). Amuko, Miheso and Ndethiu (2015) stated that teachers' attitudes toward learning with or without technology are essential because they may have an impact on curriculum reform and teaching and learning.

One of the teacher's characteristics that influence the classroom's use of ICT is attitude. ICT integration in education requires a positive outlook. A study on teachers' opinions of ICT integration was conducted by Hong (2016) utilizing open-ended, semi-structured interviews with 23 teachers from various parts of Colorado, USA. Additionally, they believe that ICT makes classroom instruction more engaging. In their experimental study on in-service mathematics teachers' use of ICT as an innovative practice in lower secondary, Daher, Baya'a, and Anabousy (2018) discovered that the teachers had favorable attitudes and beliefs. Despite their positive attitudes, teachers were hesitant to incorporate technology into their lessons because of their limited expertise and the various barriers ICT integration in education presented. According to a study by Semerci and Aydn (2018) on 353 teachers working in various schools in Ankara, Turkey, they used a descriptive research design and questionnaire to examine high school teachers' attitudes toward using ICT in the classroom. Teachers exhibited a high degree of positive attitude and low degree of worry toward the use of ICT in education. According to Ottestad (2013), an online survey of 386 teachers and 247 school leaders from Norwegian primary and lower secondary schools showed a correlation between teachers' attitudes and behaviors about the use of ICT in the classroom and those of school leaders.

The use of ICT in instruction is improved by instructors' favorable attitudes. However, nothing was known about the opinions of teachers in Kano State, Nigeria, regarding the use of ICT in teaching and learning. This section deal with the negative or positive attitude of teachers towards integration of ICT in their teaching and learning process. Studies confirm that positive attitude in teachers towards the use of ICT in teaching is important for effective integration of ICT but negative attitude is a major barrier to integration of ICT in teaching. So it was of paramount importance to conduct a study to determine the attitude of teachers towards integration of ICT in teaching and learning in Gezawa Area of Kano State, Nigeria.

2.2 Influence of teacher's attitudes towards ICT integration on student performance

Teachers' attitudes and perspectives on the use of ICTs in teaching and learning can have an impact on students' academic performance. According to research, teachers' attitudes on technology use play a significant role in how well technology is used in educational settings (Baylor & Ritchie, 2012). The use of new technology in educational settings is seen to be greatly influenced by the attitudes of the teachers. Therefore, how they feel about computers can have a

big impact on whether or not they are accepted and used. The instructors' views about using technology effectively in the classroom play a major role in this (Kluever, 2014). At this point, it would be important to find out from research the influence of integration of ICT in teaching and learning on students' performance.

The literature reviewed demonstrates a contradiction on teacher's attitudes towards ICT integration wield considerable influence on students' academic performance. It was against this background that this study sought to find out teachers' attitude towards integration of ICT in teaching and learning, and their influence on students' performance in public secondary schools of Gezawa area in Kano State, Nigeria. The study set out the following hypothesis

$H0_1$: There is no significant relationship between teachers' attitude towards integration of ICT in teaching and learning and students' performance in public secondary schools of Gezawa Area in Kano State, Nigeria

3.0 Materials and Methods

3.1 Research design

Research design is an outline of the research being carried out from the beginning to the end, it is a plan which the research will follow (Kahawa 2008). The descriptive survey research design was adopted for this study through which views and opinion were collected from the sample. The quantitative research approach was adopted for its execution and postpositivist philosophical assumption guided the study which recognizes that we cannot be absolutely positive about our claims of knowledge when studying the behavior and action of humans, this worldview is deterministic, as such, the study was carried out to determine teachers' attitude on ICT integration in teaching and learning and its influence on students' performance.

3.2 Study location

The study was carried out in Gezawa local government area of Kano State, Nigeria. Gezawa local government area was formally established in the year 1976 during the military regime of General Murtala Ramat Muhammad. Gezawa is a local government area in Kano state.

3.3 Study population

The study population was the entire teachers in public secondary schools of Gezawa local government which comprise of 16 schools, 245 teachers and 1,340 S.S 2 students. Teachers were chosen because they are directly involved in the teaching and assessment of students and S.S 2 students were targeted because it is at this level that the content starts to become more difficult and abstract.

3.4 Sampling

Krejcie and Morgan (1970) table was used to determine the actual sample size from the population of the study. A total of 152 teachers and 297 students were sampled using proportional simple random sampling from the participants of the study.

3.5 Data Collection Instruments

3.5.1 Questionnaire

The researcher administered one questionnaire namely: Questionnaire for Teachers (QFT) which consists of scale on teachers' attitude towards integration of ICT in teaching and learning. The reliability of the questionnaire means the ability of the questionnaire to gather the same data consistently under similar conditions (Burke & Christensen, 2008). Validity is a measure of the degree to which a research instrument measures what it is meant to measure.

3.5.2 Document analysis

Document analysis was used to obtain records of students' performance for individual students' average scores in their terminal examinations for 2021/2022 academic session which consist of three terms.

3.6 Model and analysis

Descriptive and inferential statistics were used for the analysis procedure. The data from the survey was analyzed using frequencies, percentages, and Pearson's product moment correlation

4.0 Results and Discussion

4.1 Descriptive analysis

The study sought to determine teachers' attitude towards integration of ICT in teaching and learning and their influence on students' performance. Teachers were asked to indicate their attitude towards ICT integration with regard to the level of their utilization in their teaching. The teachers were therefore asked to indicate the frequency with which they used some common ICT Infrastructure found in schools. This was based on a rated five-point scale of; (5) = Very often (VO); (4) = Often (O); (3) = Sometimes (S); (2) = Rarely (R); (1) = Never (N). In data analysis, reference was made to the five-point scale. Thus, the mean score 1.0 – 2.0 = N; 2.1 – 2.9 = R; 3.0 = S; 3.1 – 4.0 = O, and 4.1 – 5.0 = VO. The standard deviation (S.D) below 1.0 implies high agreement of the respondents as well as reasonable validity of the reported mean values. The S.D which is high (above 1.0) shows high variations in responses about the items asked. Table 4.1 presents the findings

Table 4.1: Teachers' attitude toward ICT integration

Tested items	N	R	S	O	VO	Mean	SD
Desktop computers	39	8	24	42	31	3.13	1.514
	27.1%	5.6%	16.7%	29.2%	21.5%		
Laptop computers	41	12	34	35	22	2.90	1.442
	28.5%	8.3%	23.6%	24.3%	15.3%		
Printers and photocopiers	27	14	38	41	24	3.15	1.338
	18.8%	9.7%	26.4%	28.5%	16.7%		
Projectors	74	15	32	18	5	2.06	1.247
	51.4%	10.4%	22.2%	12.5%	3.5%		
Internet connections	58	11	22	27	26	2.67	1.582
	40.3%	7.6%	15.3%	18.8%	18.1%		
Video players	77	33	21	9	4	1.82	1.075
	53.5%	22.9%	14.6%	6.3%	2.8%		
Teaching software	101	13	12 8.3%	11	7	1.68	1.198
	70.1%	9.0%		7.6%	4.9%		
Smart boards	65	16	20	32	11	2.36	1.432
	45.1%	11.1%	13.9%	22.2%	7.6%		
Interactive whiteboard	39	11	17	31	46	3.24	1.617
	27.1%	7.6%	11.8%	21.5%	31.9%		
Digital sound system	55	16	30	35	8	2.48	1.359
	38.2%	11.1%	20.8%	24.3%	5.6%		

As presented in table 4.3, 31 (21.5%) respondents utilized desktop computers very often and 42 (29.2%) often, while 24 (16.7%) sometimes, 8 (5.6%) rarely and 39 (27.1%) never. A corresponding mean value of 3.13 which is slightly above average, indicates that generally, respondents utilized desktop computers while the standard deviation of 1.514 shows high variations in responses. This implies that the majority of the respondents utilized desktop computers often, the high standard deviation implies high variations in responses meaning that some good number never utilized it.

With regard to laptop computers, 22 (15.3%) of the respondents utilized it very often and 35 (24.3%) often, 34 (23.6%) sometimes, 12 (8.3%) rarely and 41 (28.5%) never used it. The corresponding mean score of 2.90 which is below average indicates that majority of the respondents do not utilize laptop computers or used it rarely while a standard deviation of 1.442 means that there were high variations in responses. This implies that while majority of the respondents do not utilize laptop computers, a good number utilized it.

With regard to printers and photocopiers, most of the respondents 41 (28.5%) utilized it often and 24 (16.7%) very often, while 38 (26.4%) sometimes, 14 (9.7%) rarely and 27 (18.8%) never used

it. The findings were further supported with a mean response of 3.15 which is slightly above average, implying that the majority respondents were utilizing printers and photocopiers, and a standard deviation of 1.338 which reflects high variation in responses. Whereas the mean score implies that generally, respondents utilized printers and photocopiers, the high standard deviation implies high variations in responses meaning that some good number do not utilized it.

For projectors, a very few respondents 18 (12.5%) utilized it often and 5 (3.5%) very often, while most of the respondents 74 (51.4%) never used it and 15 (10.4%) rarely, however 32 (22.2%) used it sometimes. The findings were justified with a corresponding mean score of 2.06 which is below average and a standard deviation of 1.247 which reflects high variations in responses. This implies that generally, respondents do not utilized projectors. However, high variation in responses indicated by a high standard deviation implies that whereas the majority of the respondents do not utilized projectors, some percentage of respondents utilized it.

On internet connection, majority of the respondents 58 (40.3%) never used it and 11 (7.6%) rarely, whereas 27 (18.8%) often and 26 (18.1%) very often, 22 (15.3%) sometimes. The corresponding mean score of 2.67 indicates that majority of the respondents do not utilize internet connection while a standard deviation of 1.582 means that there were high variations in responses. This implies that generally, respondents do not utilize internet connection. However, high variation in responses indicated by a high standard deviation implies that whereas the majority of the respondents do not utilize internet connection, a good percentage of respondents utilized it.

For video players, 4 (2.8%) respondents utilized it very often and 9 (6.3%) often, 21 (14.6%) sometimes, 33 (22.9%) rarely and 77 (53.5%) never used it. The findings were further justified by the corresponding mean score of 1.82 which is below average and a standard deviation of 1.075 which indicates there were high variation in responses. This implies that majority of the respondents do not utilized video players.

For teaching software, a very few respondents 7 (4.9%) utilized it very often and 11 (7.6%) often, 12 (8.3%) sometimes, while majority 101 (70.1%) never used it and 13 (9.0%) rarely. The corresponding mean score of1.68 indicates that majority of the respondents do not utilize teaching software while a standard deviation of 1.198 means that there were high variations in responses. This implies that generally, respondents do not utilize teaching software.

For smart boards, a few respondents 11 (7.6%) utilized it very often and 32 (22.2%) often, 20 (13.9%) sometimes, while most of the respondents 65 (45.1%) never used it and 16 (11.1%) rarely. The findings were justified with a corresponding mean score of2.36 which is below average and a standard deviation of 1.432 which reflects high variations in responses. This implies that generally, respondents do not utilize smart boards. However, high variation in responses indicated by a high standard deviation implies that whereas the majority of the respondents do not utilize smart boards, some percentage of respondents utilized it.

With regard to interactive whiteboard, 46 (31.9%) respondents utilized it very often and 31 (21.5%) often, 17 (11.8%) sometimes, while 11 (7.6%) rarely and 39 (27.1%) never used it. The findings were further supported with a mean response of 3.24 which is above average, implying that the majority respondents were utilizing interactive whiteboard, and a standard deviation of 1.617 which reflects high variation in responses. Whereas the mean score implies that generally, respondents utilized interactive whiteboard, the high standard deviation implies high variations in responses meaning that some good number do not utilized it.

For digital sound system, 8 (5.6%) respondents utilized it very often and 35 (24.3%) often, 30 (20.8%) sometimes, 16 (11.1%) rarely and 55 (38.2%) never used it. The corresponding mean score of2.48 indicates that majority of the respondents do not utilize digital sound system while a standard deviation of 1.359 means that there were high variations in responses. This implies that generally, respondents do not utilize digital sound system. However, high variation in responses indicated by a high standard deviation implies that whereas the majority of the respondents do not utilize digital sound system, some percentage of respondents utilized it.

4.2 Correlation analysis

Correlation analysis was done to determine relationships between the study variables. Pearson product moment correlation coefficient test showed that there was weak positive relationship between teacher's attitudes towards integration of ICT and students' performance ($r=.178$, $p<.05$) as shown in Table 4.2.

Table 4.2: Correlation Coefficients

Variable	**Student's performance**	
	Correlation Coefficient	**Sig. Value**
Teacher's attitude	.178*	.033

4.3 Discussion

Findings of the study revealed that few of the ICT infrastructures like desktop computers, printers and photocopiers and interactive whiteboard are utilized by the respondents. While most of the infrastructures like laptop computers, projectors, internet connection, video players, teaching software and smart boards are not utilized. This implies that teachers have negative attitude towards integration of ICT. This is in consistent with the finding of Bitok (2014) which revealed that the majority of teachers only use ICT sporadically. It agrees with Msila (2015) who conducted a study in South Africa. Findings demonstrated that teachers were reluctant to the use of ICT and some were even discouraged by the introduction of ICT. It is also in consistent with Daher, Baya'a, and Anabousy (2018) study whom discovered that teachers were hesitant to incorporate technology into their lessons. This study's finding is contrary to the finding of Yapici and Hevedanli (2012) whom asserted that instructors had positive attitudes towards ICT utilization,

regardless of gender or class. It is also contrary to that of Semerci and Aydn (2018) whom revealed that secondary school teachers exhibited a high degree of positive attitude and low degree of worry toward the use of ICT in education in Ankara, Turkey.

To ensure that the technology integration is successfully carried out in the curriculum of the school as well as during teaching and learning, it is crucial that school teachers have positive attitudes about the use of ICTs, thus, teachers' views are influenced by how they view the value of ICT, how they intend to behave, and pedagogical factors, also, several factors affect teachers' views on utilizing ICT in teaching and learning (Amuko, Miheso and Ndethiu, 2015). Findings of this study revealed a weak positive relationship between teacher's attitude toward ICT and student's performance. And that teacher's attitude towards ICT has some influence on student's performance. This agrees with the findings of Baylor & Ritchie (2012) and Kluever (2014) in their studies. The former discovered that teachers' attitudes on technology use play a significant role in how well technology is used in educational settings, he further explained that teacher's attitudes toward ICT utilization greatly influence student's performance. The later asserted that the use of new technology in educational settings is seen to be greatly influenced by the attitudes of teachers in terms of utilization. Therefore, how they feel about computers can have a big impact on whether or not they are accepted and used. The instructors' views about using technology effectively in the classroom and level of their utilization plays a major role on student's performance. It is also consistent with report of Scrimshaw (2004); ICT can help teachers change their traditional pedagogical beliefs, implement new student-centered teaching strategies, and enhance stronger relationships between teachers and students thereby improving student's performance.

5.0 Conclusions and Recommendations

Based on the findings of the study, it can be concluded that;

i) There is some level of ICT infrastructure utilization by teachers. Teachers utilized desktop computers, printers and photocopiers and interactive whiteboard. Therefore, teachers' attitude toward integration of ICT in teaching and learning has some influence on student's performance in the schools studied.

ii) Teachers' attitudes have a positive significant effect on student's performance. The association between teachers' attitudes towards ICT integration and student's performance were positive and the former had contribution on latter in the government aided secondary schools in Gezawa Area, Kano State Nigeria.

iii) To a greater extent when teachers have positive attitudes towards ICT integration in their schools, ICT usage in schools is bound to increase which leads to better service delivery in schools leading to increase in student's performance.

The study recommends that:

i) Ministry of Education should provide all schools with well documented ICT policies which should dove-tail into the NPE ICT policy in education.
ii) The government of Nigeria through the Ministry of Education should consider organizing more in-service and on job training in retooling of school-based ICT users for effective ICT integration in teaching and learning for better students' performance.
iii) The school heads should always act timely in responding to teachers' and other staffs' needs concerning ICT usage to enhance and maintain their ICT passion for effective ICT integration in teaching and learning for better student's performance in secondary schools.

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Conflict of Interest

The authors declare no conflict of interest.

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