Assessment of Teachers' Experience in the Application of Computer-Assisted Instruction (CAI) in Public Secondary Schools in Zango Kataf Local Government, Kaduna State, Nigeria

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Abstract
The study explored teachers' experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government, Kaduna State, Nigeria. The objective of the study is to assess teacher's experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. The objective was transcribed into a research question and a hypothesis respectively. Survey research design was adopted in the study. The target population of the study was made up of 409 respondents, which consist of 43 principals, 361 teachers and 5 ministry of education officials in Zango Kataf Local Government, Kaduna State, Nigeria. A sample size of 217 respondents, which comprised 202 teachers, 12 principals, and 3 MOE officials. The instrument titled "Teacher Factors in the Application of Computer-Assisted Instruction Questionnaire (TFACAIQ)" was used for data collection in the study. The validated instrument was pilot tested, the reliability co-efficient was determined using Cronbach Alpha statistic and a reliability coefficient of 0.78 was obtained. The data collected in the study was analysed using descriptive statistics; frequency counts, mean and standard deviation to answer the research questions. Kruskal-Wallis was used to test the four null hypotheses at 0.05 level of significance. Findings of the study revealed that teacher's experience has no significant influence on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. The study recommend that Teachers' training programmes should be oriented in removing fears as expressed by teachers having a greater number of years of experience and belonging to higher age-group of getting replaced by new technologies like ICT.

Introduction

There is a growing demand on educational institutions to use computer-assisted instruction (CAI) to teach the skills and knowledge students need for the 21st century. Computer-assisted instruction (CAI) is an example of the use of information and communication technology (ICT) supported teaching and learning processes. Realizing the impact of computer on the workplace and everyday life, today's educational institutions try to restructure their educational curricula and classroom facilities, in order to bridge the existing technology gap in teaching and learning. To give students knowledge and information about certain subject areas,

to encourage meaningful learning, and to increase professional productivity, this restructuring process demands successful incorporation of technologies into the existing teaching and learning environment.

Importantly, the application of CAI into the educational process offers numerous advantages. In this sense, the application of CAI in classes to complement conventional teaching methods is associated with greater student motivation through the use of more attractive, entertaining, and fun tools (Bullock in Gomez-Fernandez & Mediavilla, 2022; Tüzün et al., 2009). Sequel to say that, CAI enables greater interactivity in learning, with more opportunities for cooperation and an improvement in communication between teachers and students (Schulz-Zander, Büchter & Dalmer, 2012). CAI also stimulates initiative and creativity (Allegra, Chifari & Ottaviano, 2011; Wheeler, Waite & Bromfield, 2012) and facilitates the individualization and flexibilization of education (Abell, 2006). These advantages, among others, can improve students' acquisition of knowledge and have a positive influence on students' academic performance.

Teaching/working experience of teachers is another attribute which influence the application of CAI in the classrooms. The existing research shows that there are mixed results found in the relationship between teacher's work experience and their use of CAI in the classrooms. For example, Lau and Sim (2008) demonstrated that experienced teachers are more willing to use technology in the classroom. They argued that more experienced teachers are in fact reluctant to use technology in the classrooms as compared to non-experienced and young teachers.

In addition to teacher commitment and skill, other noteworthy factors include teacher self-efficacy and belief in the use of CAI. Other researchers have also identified teacher training as a factor in the classroom application of CAI. Adequate teacher training would not only lead to an increase in CAI competency (which is the typical goal), but would also compel teachers to view and experience the benefits of novel CAI use that focuses the teaching and learning experience on the student. The role of the teacher in this context is to direct learning, while sharing knowledge and experience with other teachers engaged in CAI application in the form of collaborative communities.

Computer-assisted instruction is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place (Alasoluyi, Shaibu & Garba, 2016). CAI learning uses a combination of text, graphics, sound and video in learning process. The technique of presenting textual and visual material to a student in a logical order while using a computer is known as computer-assisted instruction (CAI) (Alasoluyi, 2021). The learner either reads the provided text content or looks at the displayed graphics to learn. Some curricula provide students the option to choose audio presentations in addition to visual material during audio-visual presentations. Following each paragraph of text are questions that call for a student response. A prompt indication of feedback on a response are also

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received immediately (Locatis & Atkinson; Wang & Sleeman in Alasoluyi, 2015).

Computer-assisted instruction (CAI) can be described as interactive and personalized learning (Curtis & Howard, 2010). In a class, there may be one or more students, they may be young or old, intelligent or not, physically "normal" or disabled, highly motivated or "turned off," wealthy or not, male or female, and they may be both male and female. All these have equal access to CAI (Alasoluyi, 2015). In cases like televised instruction or computer-assisted instruction (CAI), the teacher might not be physically present. Therefore, CAI provides rich opportunities for helping students to move beyond being problem-set smart toward a problem-solver. The actual use of computer technology in instructional practice is still limited due to obstacles related to teaching staff members and students, technical potentials, and available financial resources.

Teaching experience is the culmination of skills, exposure, or training acquired over time that enables a teacher to perform their task or prepare them for a teaching position (Indeed.com, 2023). Though some research reported that teachers' experience in teaching did not influence their use of computer technology in teaching (Niederhauser & Stoddart, 2001), most research indicated that teaching experience influences the successful use of ICT in classrooms (Wong & Li, 2008; Giordano, 2007; Hernandez-Ramos, 2005). Gorder (2008) reported that teacher experience

is significantly correlated with the actual use of technology.

According to the U.S National Centre for Education Statistics (2000), teachers with up to three years of teaching experience reported spending 48% of their time utilizing computers, teachers with teaching experience between 4 and 9 years, spend 45% of their time utilizing computers, teachers with experience between 10 and 19 years spend 47% of the time, and finally teachers with more than 20 years teaching experience utilize computers 33% of their time.

For educationists, the real challenge lies in how to use CAI to balance the role of the teacher in the classroom. There is a lot of apprehension, if not outright fear, about the role of teachers in CAI equipped classrooms. Teachers who don't have the opportunity to develop professionally using modern technologies feel threatened. A teacher's importance in 21st century society is determined by how much they are willing to evolve in this manner. But despite the policies aimed at integrating technology into the classroom, this paradox is what makes the situation of the teachers in Zango Kataf Local Government Area, Kaduna State, Nigeria, particularly interesting. To gain a better understanding of this topic, this study aimed to evaluate the experience of teachers in Zango Kataf LGA in relation to the use of computer assisted instruction in the public secondary schools.

Statement of the Problem

There have been concerns raised by the Education stakeholders about the

ways in which CAI could be integrated in teaching and learning to enhance the acquisition of knowledge and skills in secondary schools. One general concern is that in Kaduna State, the application of CAI in learning and teaching has been less than was originally anticipated. The reality in the classroom today falls short of the aspirations of those promoting the use of CAI in teaching and learning in schools, especially in public secondary schools in Zango Kataf Local Government Area. Generally, the learning and teaching strategy used in many public secondary schools in Kaduna State tends towards being largely examination-oriented, involving mainly "chalk and talk" methodology.

Teachers feel reluctant to apply CAI in their instructional practices. Fear of failure and lack of CAI knowledge have been cited (Balanskat, Blamire & Kafal, 2007) as some reasons for teachers' lack of confidence in adopting and applying CAI into their teaching. Research conducted by Gil-Flores, Rodríguez-Santero and Torres-Gordill (2017) identified a number of practical and teacher psychological factors that impede application of CAI in the classroom. One of these factors is doubts held by teachers over the value of CAI in promoting learning, clear rationale for the inclusion of CAI skills in teaching, lack of adequate training for teachers in CAI skills and its pedagogy and lack of time for teachers to plan for effective use of CAI in their lessons.

In addition, teaching experience has a big impact on how CAI is applied. For instance, it has been shown that teachers with greater experience in the classroom are more likely than those without it to use CAI in their instruction (Buabeng-Andoh, 2012). Therefore, an understanding of personal characteristics that influence teachers' adoption and integration of CAI into teaching is relevant. To the best knowledge of the researcher, no previous research has been carried out on teachers' experience in the application of CAI in teaching and learning in the public secondary schools within Zango Kataf Local Government Area, Kaduna State, Nigeria. The need for research in this area became apparent to the researcher because of the conventional learning style attributed to public secondary schools in Zango Kataf Local Government Area. The investigation therefore sought to assess teachers' experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government, Kaduna State, Nigeria.

Objectives of the Study

The objective of this study is to:

i. assess teacher's experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State

Research Questions

This question guided the study:

i. To what extent does teacher's experience influence the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State?

Hypothesis

This null hypothesis was formulated and tested at 0.05 probability level:

HO_1: There is no significant difference in the response of teachers, principals, and ministry of education officials on teacher's experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

Methodology

A survey research design was adopted in the study. The target population of the study was made up of 409 respondents, which consisted of 43 principals, 361 teachers and 5 Ministry of Education officials in Zango Kataf Local Government, Kaduna State, Nigeria. A sample size of 217 respondents, which comprised 202 teachers, 12 principals, and 3 MOE officials. The instrument titled "Teacher Factors in the Application of Computer-Assisted Instruction Questionnaire (TFACAIQ)" was used for data collection in the study. The validated instrument was pilot tested, the reliability co-efficient was determined using Cronbach Alpha statistic and a reliability coefficient of 0.78 was obtained. The data collected in the study was analysed using descriptive statistics; frequency counts, mean and standard deviation to answer the research questions. Kruskal-Wallis was used to test the four null hypotheses at 0.05 level of` significance.

Results

Research Question: To what extent does teacher's experience influence the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government, Kaduna State?

The data collected through the administration of questionnaire was analysed using frequency counts, mean and standard deviation. The summary of analysis made on this research question is presented in table 1.

Table 1:   Teacher's Experience in the Application of CAI in Public Secondary Schools in Zango Kataf Local Government, Kaduna State

SN	Item Statements	Respondents	SA	A	U	D	SD	Mean	SD
1.	The more years of experience teachers have, the more likely that they will apply CAI to provide feedback and/or assess students' learning.	MOE	-	3	-	-	-	2.000	0.000
		Principals	1	7	2	1	1	2.500	1.087
		Teachers	2	89	51	34	26	3.034	1.080
2.	Teachers with less experience in teaching are more likely to integrate CAI in their teaching than teachers with more experience in teaching.	MOE	-	-	2	-	1	2.333	1.154
		Principals	1	5	3	2	1	2.250	1.138
		Teachers	-	49	21	118	14	2.341	0.923

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No.	Statement	Group						Mean	SD
3.	Most teachers lack the technological experience required to integrate CAI to their classroom practice.	MOE	-	2	-	-	1	3.000	1.732
		Principals	1	8	3	-	-	3.833	0.577
		Teachers	8	119	38	20	17	3.401	1.013
4.	Experience to shape instruction to teacher-perceived student needs encouraged the innovative application of CAI by teachers.	MOE	-	3	-	-	-	3.000	0.000
		Principals	-	5	4	-	3	2.166	0.834
		Teachers	-	97	30	31	44	2.891	1.224
5.	Experienced teachers are less ready to integrate technology into their teaching.	MOE	-	1	1	-	1	2.687	0.834
		Principals	1	9	2	-	-	3.197	0.514
		Teachers	5	108	32	17	40	3.104	1.227
6.	Teachers have the competence to identify topics that are well suited to CAI application.	MOE	-	2	-	-	1	2.422	1.732
		Principals	1	4	6	1	-	3.001	0.792
		Teachers	24	28	28	122	-	2.227	1.082
7.	Teachers' computer experience relates positively to their ability to use CAI to prepare exercises and tasks for students.	MOE	-	2	-	1	-	3.333	1.154
		Principals	1	2	6	3	-	3.083	0.900
		Teachers	-	57	47	80	18	2.841	1.182
8.	Technological comfort levels foster teacher CAI application in the classroom.	MOE	-	-	2	1	-	2.666	0.577
		Principals	1	4	4	1	2	2.083	1.240
		Teachers	-	90	47	43	22	3.014	1.048
9.	Older teachers frequently use computer technology in the classrooms more than the younger teachers.	MOE	-	2	-	1	-	2.333	1.154
		Principals	1	6	3	-	2	2.893	1.230
		Teachers	2	82	34	39	45	2.787	1.221
10.	Experienced teachers have the technology competence to create curiosity and independent thought in students during CAI application.	MOE	-	-	1	2	-	2.332	0.577
		Principals	3	3	3	2	1	2.416	1.311
		Teachers	1	88	34	64	15	2.980	1.036
		Average Mean						2.73	0.98

Table 1 revealed the extent to which teacher's experience influence the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. The table presents the average response mean of 2.73 which is lesser than the rating mean of 3.0. By implication, teacher's experience has no influence on

the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. Most of the items stated on this research question recorded a response means lesser than the rating mean of 3.0, which indicated disagreement on the part of the participants. This is evident with item number 3 on the table which divulged that many teachers lack the technological experience required to integrate CAI to their classroom practice.

Hypothesis: There is no significant difference in the response of teachers, principals and ministry of education officials on teacher's experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

The response of MOE, principals, and teachers regarding the hypothesis was analysed using Kruskal-Wallis. The summary of the hypothesis tested is presented in table 2:

Table 2: Summary of Kruskal-Wallis Statistics on the Influence of Teacher's Experience in the Application of Computer-Assisted Instruction (CAI) in Public Secondary Schools in Zango Kataf Local Government Area, Kaduna State

Group	N	Mean Rank	df	α	P-value	Decision
MOE	3	11.502				
Principal	12	11.671	2	0.05	.402	Retained
Teacher	202	11.200				

Table 2 revealed that teacher's experience has no significant influence on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. The table showed the p-value of .402 at 2 degrees of freedom. Since the p-value (.402) is greater than the alpha level (0.05), the hypothesis which says that there was no significant difference in the response of ministry of education officials, principals, and teachers on teacher's experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State was retained.

Major Finding

The finding established in this study is that:

1- Teacher's experience has no significant influence on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

Discussions

The finding of the study revealed that teacher's experience has no influence on the application of

computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. This was evident as it was divulged that the majority of teachers lack the technological experience required to integrate CAI to their classroom practice. Therefore, the hypothesis which states that there is no significant difference in the response of ministry of education officials, principals, and teachers on teacher's experience in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State was retained. This conclusion is consistent with that of Basargekar and Singhavi (2017), who found that prior computer-related experience is positively correlated with one's perception of one's ability to use ICT in the classroom. This finding triangulated well with the findings of Tenai (2017) which revealed significant relationship exists between teaching experience and technology literacy.

Conclusions

In view of the finding from this study, it was concluded that:

1. The use of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State, is unaffected by the teacher's experience.

Recommendation

The study recommends that:

1. The focus of teacher training programmes should be on allaying teachers' concerns about being replaced by new

technologies like ICT, which include those who have more years of experience and are older.

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