

Impact of Teacher's Training Factor in the Application of Computer-Assisted Instruction in Public Secondary Schools in Zango Kataf Local Government Area, Kaduna State

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ABSTRACT

The study explored Teacher's Training Factor in the application of Computer-Assisted Instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. The objective of the study is to determine teacher's training 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 questions and a hypothesis respectively. Survey research design was used 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 Area, Kaduna State. 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 training has significant influence on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. Recommendations were that, Kaduna State Government should ensure accessibility to good quality ICT infrastructure is developed to enable teachers enrol for online distance courses in ICT integration in teaching and learning especially science subjects. This study recommends that teachers and learners need to be supported through face-to-face training in the ICT skills necessary for teaching and learning. This will enable them to develop the required confidence needed to integrate ICT skills in a classroom environment.

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INTRODUCTION

The application of Computer Assisted Instruction to teach the skills and knowledge to students in the 21st century is being emphasised due to its 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

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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.

Despite all the potential advantages of using CAI for educational purposes in classes, there is still a low usage rate of CAI for educational purposes in Zango Kataf Local Government Area, Kaduna State. Teachers may find it impossible to incorporate CAI into their work without support and encouragement from colleagues, parents, and leaders. To bring this about, these community members may also need professional development, along with the teachers. In this regard, considering that the application of CAI for educational purposes in classes is ultimately decided by the teacher of each subject, it is of great interest to analyse what factors determine whether a teacher is more or less conducive to the use of these tools. Numerous studies consider teachers and their attitudes, training, concepts, or practices to be factors in the application of CAI into the classroom that possess much greater weight than other factors (Akbulut et al., 2007, Drent and Meelissen, 2008, Koh and Chai, 2014, Lee and Lee, 2014, Prestridge, 2012, Tondeur et al., 2008, Valtonen et al., 2015).

Other noteworthy factors include teachers' commitment and skill (Ertmer et al., 2007, Fraizer and Bayley, 2004, Koehler and Mishra, 2009), their self-efficacy in CAI use (Kreijns et al., 2013, Rohatgi et al., 2016), and their beliefs regarding the use of technologies (Bas et al., 2016). Other researchers also consider teacher training to be factors in the application of CAI into the classroom. Adequate training would not simply increase levels of CAI competency, which represents the typical goal (Gillen et al., 2007, Hennessy et al., 2007), but also compel teachers to perceive and experience the advantages of innovative CAI use that orients the

teaching and learning process towards the student. In this context, the teacher plays the role of directing learning while sharing ideas and experiences with other teachers involved in CAI application, in the style of collaborative communities.

Specifically, Lee and Lee (2014) speak of encouraging the self-efficacy beliefs of teachers with respect to technology integration, teacher attitudes towards computers, computer use, lesson-planning skills, knowledge for effective technology integration, and instructional media development skills. The real challenge for educationists is, therefore, how to harness the potential of CAI to complement the role of a teacher in the teaching and learning process. There is an understandable apprehension, even fear, as to the role of a teacher in CAI-equipped classroom. Teachers who lack the chance to develop professionally in the use of modern technologies feel under threat. The relevance of a teacher in the 21st century is determined by their willingness to develop in this way. However, despite the policies directed at incorporating technology into teaching, this paradoxical situation makes the case of Zango Kataf Local Government Area particularly interesting. In an effort to increase understanding of this issue, this study sought to assess teacher factors associated with the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

Statement of the Problem

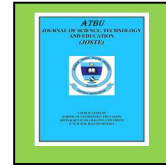
There have been concerns raised by the Education stakeholders about the ways in which CAI could be integrated in teaching and learning to enhance the acquisition of knowledge and skills in secondary schools. One general concern is that in Kaduna State, the application of CAI in learning and teaching 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 the majority

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of 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 of the reasons for teachers’ lack of confidence for 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.

Studies concerning teachers’ gender in the application of CAI have cited female teachers’ low levels of computer use due to their limited technology access, skill, and interest (Volman & van Eck, 2001). Research also revealed that male teachers used more CAI in their teaching and learning processes than their female counterparts (Kay, 2006; Wozney, Venkatesh & Abrami, 2006). Lack of in-service training is cited as one of the major barriers for applying CAI in the classroom by many teachers (Basargekar & Singhavi, 2017). More so, the attitudes of teachers towards technology greatly influence their adoption and integration of CAI into their teaching. However, lack of confidence and competence and fear often implies CAI takes a back seat to conventional learning mechanisms.

Concurrently, teaching experience play a significant role in the application of CAI. For instance, teachers with less experience in teaching has been report to likely integrate CAI in their teaching than teachers with more experience in teaching (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 teacher factors

in the application of CAI in teaching and learning in the public secondary schools within Zango Kataf Local Government Area, Kaduna State. 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 teacher factors in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. Specifically, the study sought to:

- 1- Determine teacher’s training in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

Research Question

This research question guided the study:

1. What is the influence of teacher’s training on 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:

- H₀: There is no significant difference in the response of teachers, principals and ministry of education officials on teacher’s training in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

METHODOLOGY

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

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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's 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 One: What is the influence of teacher's training on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, 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 training in the application of CAI in public secondary schools in Zango Kataf Local Government Area, Kaduna State

SN	Item Statements	Respondents	Mean	SD
1.	My school has a technology training programme for its teachers.	MOE	3.333	0.577
		Principals	2.520	1.138
		Teachers	2.990	1.176
2.	Technology integration is part of the pedagogical training I received as a teacher.	MOE	2.666	0.577
		Principals	2.986	1.614
		Teachers	2.843	1.202
3.	I have been involved during the past two school years in technology training as part of professional development opportunities.	MOE	2.655	0.123
		Principals	2.666	1.230
		Teachers	2.732	1.152
4.	I have never been involved in subject-specific training on CAI applications (such as tutorials, simulations, etc.).	MOE	4.000	0.000
		Principals	3.916	0.900
		Teachers	3.940	1.058
5.	My school has a technology training programme on multimedia (using digital video, audio equipment, etc.).	MOE	3.011	0.574
		Principals	2.904	1.164
		Teachers	2.609	1.135
6.	I recently receive introductory courses on general applications (basic word-processing, spreadsheets, presentations, databases, etc.).	MOE	2.895	0.577
		Principals	2.666	1.302
		Teachers	2.762	1.052
7.	I have never been involved in advanced courses on CAI applications (such as drill and practice, etc.).	MOE	3.933	0.745
		Principals	3.915	1.164
		Teachers	3.113	1.018
8.	I always had a computer to practice at home after training sessions.	MOE	2.966	0.577
		Principals	2.887	1.156
		Teachers	2.554	0.891
9.	My school regularly organise courses on the pedagogical use of CAI in teaching and learning.	MOE	2.745	0.567
		Principals	2.978	1.595
		Teachers	2.854	1.014
10.	My school regularly provide first level technical support for teachers to apply the required CAI tools in their class work.	MOE	2.600	0.410
		Principals	2.584	1.164
		Teachers	2.904	1.195
			0.93	

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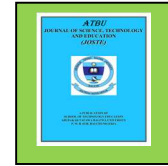


Table 1 revealed the extent to which teacher's training influence the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. The table presents the average response mean of 3.00 which is equal to the rating mean of 3.0. By implication, teacher's training has 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 higher than the rating mean of 3.0, which indicated agreement on the part of the participants. This is evident with item number 4 on

the table which divulged that most teachers have never been involved in subject-specific training on CAI applications (such as tutorials, simulations, etc.).

Hypothesis: There is no significant difference in the response of teachers, principals and ministry of education officials on teacher's training 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 hypothesis four 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 Training 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	27.333				
Principal	12	17.502	2	0.05	.001	Rejected
Teacher	202	19.336				

Table 2 revealed that teacher's training significantly influenced 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 .001 at 2 degrees of freedom. Since the p-value (.001) is lesser 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 training in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State was rejected.

FINDING

This finding was established in the study:

- 1- Teacher's training has significant influence on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

DISCUSSION OF FINDING

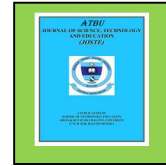
The finding of the study revealed that, teacher's training has influence on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State. This was evident as the study divulged that most teachers have never been involved in subject-specific training on CAI applications (such as tutorials, simulations, etc.). Therefore, hypothesis four which states that there is no significant difference in the response of ministry of education officials, principals, and teachers on teacher's training in the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State was rejected. This finding is in agreement with the findings of Tenai (2017) which revealed that significant correlation exists between training and technology literacy, knowledge deepening and knowledge creation. The level of training affects ICT integration in the teaching of English

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language. The finding aligned with the findings of Keiyoro (2010) which established that even in cases where teachers had received some ICT training, not much time was allocated for the teachers to apply and implement the ICT skills they had gained into their teaching methodology. The teachers also lacked pertinent information and skills necessary to enable them to access relevant scientific information from the Internet. The finding also contradict the findings of Basargekar and Singhavi (2017) that, a compulsory component of teacher training programs in ICT where most of the surveyed female teachers are working. The study further confirms that teachers' training programs have a positive impact on teachers' perceived proficiency on using ICT.

CONCLUSION

In view of the finding from this study, it was concluded that, overall, teacher's training has influence on the application of computer-assisted instruction (CAI) in public secondary schools in Zango Kataf Local Government Area, Kaduna State.

RECOMMENDATIONS

Recommendations were made in the study that:

1. Kaduna State Government should ensure accessibility to good quality ICT infrastructure is developed to enable teachers enrol for online distance courses in ICT integration in teaching and learning especially science subjects.
2. This study recommends that teachers and learners need to be supported through face-to-face training in the ICT skills necessary for teaching and learning. This will enable them to develop the required confidence needed to integrate ICT skills in a classroom environment.

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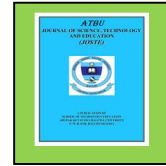
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