



Correlation Between Teachers' Pedagogical Knowledge of Multi-Media and ... Kabir, Z. A., Et. al. (2026)

Correlation Between Teachers' Pedagogical Knowledge of Multi-Media and Instructional Technology Teaching: A Case Study of Federal University of Education Zaria, Kaduna State

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Abstract

This paper examined Assessment of Teachers' Knowledge of ICT (Multi-Media Approach) in teaching Instructional Technology in Federal University of Education Zaria, Kaduna State-Nigeria. The study adopted a correlational survey design. The study population comprised forty-three (43) lecturers. Due to the manageable size of the population, all the 43 lecturers were included in the study using a census sampling technique. The instrument for data collection was a structured questionnaire and Observation Checklist/Scale for Effective Teaching of Instructional Technology. Reliability of the instrument was established using Cronbach Alpha, yielding a coefficient of 0.792. Descriptive statistics of mean scores and standard deviation were used to answer research questions while inferential statistics of Spearman Correlation was used to test the study hypotheses at 0.05 level of significance. The findings of this study reveals that there is a significant positive relationship between teachers' pedagogical knowledge of ICT and effective teaching of instructional technology ($r = 0.712, p < 0.05$). The findings also reveals that there is a strong significant positive relationship between teachers' content knowledge and ICT integration and effective teaching of instructional technology ($r = 0.763, p < 0.05$). Based on the findings, it was recommended among others that: Universities should prioritize continuous professional development that focuses on both pedagogical knowledge of ICT and content-specific integration.

Keywords: Teacher knowledge, ICT, Effective teaching of instructional technology.

Introduction

Knowledge acquisition is considered the basic level of ICT competencies which manifest in the ability to use technologies as a supplement to classroom practice while enhancing users' technological competencies (UNESCO, 2018). The shift from a view of Information Communication Technology (ICT) as a special activity where teachers have no control over to the one where teachers view ICT as a tool for teaching and learning is gaining currency globally. The focus of integrating ICT in education has increasingly become an important concern in education not only in developed countries but in developing countries as well (Anna & Bilatam, 2020). The task of teaching and research according to Adeyanju and Gbenga (2022) has received a boost essentially because information and



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communication technology get deployed to teaching. The realisation that ICT is the new normal reflects in the programmes of pre – service and in - service teachers who tend to motivate the self and get acquainted with the tool that helps in meeting the set goal of teaching and instructional delivery with minimal stress. Most tasks of teaching are now accomplished through the use of visual, audio, audio visual, real objects and contrive materials because they appeal to the senses of sight, hearing and touch. In addition, teachers are also becoming familiar with the rudiment of designing which is an activity based process of teaching and learning with consideration to an enriched environment. The term ICT integration in education generally refers to a technology-based approach to teaching and learning in which teachers use technology to facilitate learning in the classroom (Tshewang, 2019).

Multimedia approach is an interactive computer system that combines two or more media, including pictures, text, sound, and integrated animation, in a computer application (Jiang, 2022). Utilising this computer medium help teachers present more diverse learning contents, facilitate the interaction between students and the medium, and lay a solid foundation of professional knowledge, thereby optimising the teaching and learning environment and enhancing the educational quality. Teachers, as the architects of knowledge dissemination, find themselves at the forefront of this technological transformation, where their knowledge and proficiency in various aspects of ICT play a pivotal role in shaping the learning experiences of the next generation (Kumari & Srivastava, 2023). As the foundation of any technological endeavor, teachers are expected to possess basic computer skills that extend beyond mere familiarity with hardware and operating systems. Proficiency in utilizing common software applications, ranging from word processors to spreadsheet tools, forms the bedrock of their digital expertise. A teacher's ability to discern reliable online resources and curate relevant content is vital in providing students with accurate and up-to-date information. Moreover, digital communication skills, including email etiquette and collaboration tools, empowers teachers to foster effective communication channels within and beyond the classroom. Educational software has emerged as a powerful ally in the pedagogical arsenal, offering diverse tools for interactive and engaging learning experiences. Teachers with knowledge of such software can tailor their lesson plans to incorporate dynamic multimedia content, simulations, and gamified elements, thereby catering to varied learning styles and enhancing student engagement (Bhattacharjee, & Deb, 2016). Besides this, understanding the advantages that ICT brought in the traditional educational system will helps in increasing the demand for ICTs. Teachers equipped with the know-how of ICT tools can deliver dynamic presentations, annotate content in real-time, and create an immersive learning environment. Multimedia approach in teaching enhances the mastering of vital skills of a student by proper practice and drilling. It has also helped in providing solutions to problems by the use of learning how to do it yourself and the understanding of abstract concepts (Dominic-Ugwu & Nonyelum, 2019). Multimedia integration into teaching not only captivates students' attention but also facilitates a deeper understanding of complex concepts. Pedagogical knowledge is an in-depth understanding of teaching processes as emphasized by Luhamya, Bakkabulindi, and Muyinda (2017) such as lesson planning, classroom management, and evaluation are more effective with ICT integration. Teachers with deep pedagogical knowledge are more likely to design ICT-supported lessons that align with students' learning needs and cognitive levels. Akturk and Ozturk (2019), who reported that teachers who exhibited solid knowledge in both Content Knowledge (CK) and Pedagogical Content Knowledge (PCK) dimensions are better adept at applying digital tools to teaching contexts.

Statement of the Problem



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The integration of Information and Communication Technology (ICT) in teaching has become a crucial aspect of modern education, particularly in higher learning institutions. However, despite the increasing adoption of ICT tools in classrooms, the effective integration of these technologies remains a challenge. In the context of Department of Curriculum and Instruction, Federal University of Education, Zaria there is limited understanding of how teachers' pedagogical knowledge of ICT and their content-specific ICT integration skills influence their ability to deliver effective technology-enhanced instruction. Pedagogical knowledge refers to a teacher's understanding of how to integrate ICT into their teaching methods, while content knowledge involves the teacher's expertise in their subject matter combined with the strategic use of ICT to facilitate learning. There is a need to assess how these two components contribute to the overall effectiveness of instructional technology in the university setting, ensuring that educators are equipped with the necessary skills to enhance student learning outcomes. The problem further extends to understanding the specific relationships between these areas of teacher knowledge and their impact on the quality of ICT integration in teaching practices. While research globally suggests that both pedagogical knowledge and content knowledge are essential for effective technology integration, there is a gap in understanding how these factors interact in the context of the Federal University of Education, Zaria. This study aims to address this gap by examining the relationship between teachers' pedagogical knowledge of ICT and effective teaching, as well as the relationship between content knowledge of ICT integration and instructional effectiveness.

Objectives of the Study

The specific objectives of the study are to:

1. assess the relationship between teachers' pedagogical knowledge of ICT and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria.
2. ascertain the relationship between teachers' content knowledge of ICT integration and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria.

Research Questions

The following questions were answered:

1. What is the relationship between teachers' pedagogical knowledge of ICT and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria?
2. What is the relationship between teachers' content knowledge of ICT integration and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between teachers' pedagogical knowledge of ICT and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria.
2. There is no significant relationship between teachers' content knowledge of ICT integration and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria.

Research Methodology



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This study adopted a correlational survey design. The study population comprised forty-three (43) lecturers from the Federal University of Education, Zaria. Due to the manageable size of the population, all 43 lecturers were included in the study using a census sampling technique.

The instrument for data collection was a structured questionnaire and Observation Checklist/Scale for Effective Teaching of Instructional Technology. Both questionnaire and checklist comprises of ten (10) items. The instrument was subjected to expert validation by senior lecturers in the Faculty of Education, Curriculum and Instruction Department, Federal University of Education, Zaria. Their suggestions and corrections were reviewed, harmonised, and incorporated to improve the clarity and relevance of the items. Reliability of the instrument was established using Cronbach Alpha, yielding a coefficient of 0.792, indicating high internal consistency. Descriptive statistics of mean scores and standard deviation were used to answer research questions while inferential statistics of Spearman Correlation was used to test the study hypotheses at 0.05 level of significance.

Presentation of Results

Research Question One: What is the relationship between teachers' pedagogical knowledge of ICT and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria?

Table 1: Mean and Standard Deviation scores of the respondents on Pedagogical Knowledge of ICT and Effective Teaching of Instructional Technology

Variable	N	Mean	Std. Dev.
Pedagogical Knowledge of ICT	43	4.40	0.40
Effective Teaching of Instructional Technology	43	3.15	0.55

Table 1 revealed that the mean score for Pedagogical Knowledge of ICT is 4.40, indicating that lecturers at Department of Curriculum and Instruction, Federal University of Education, Zaria generally have a strong pedagogical understanding of ICT. The mean score for Effective Teaching of Instructional Technology is 3.15, suggesting that lecturers' integration of instructional technology, although notable, is somewhat lower in comparison to their pedagogical knowledge of ICT.

Research Question Two: What is the relationship between teachers' content knowledge of ICT integration and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria?

Table 2: Mean and Standard Deviation scores of the respondents on Content Knowledge of ICT Integration and Effective Teaching of Instructional Technology

Variable	N	Mean	Std. Dev.
Content Knowledge of ICT Integration	43	4.48	0.38
Effective Teaching of Instructional Technology	43	3.20	0.58

Table 2 revealed that the mean score for Content Knowledge of ICT Integration is 4.48, showing a strong integration of content knowledge with ICT tools by the lecturers. The mean score for Effective Teaching of Instructional Technology is 3.20, indicating that there is a relatively moderate level of effective teaching, though there is still room for improvement in the use of ICT to its full potential in teaching.

Hypothesis One: There is no significant relationship between teachers' pedagogical knowledge of ICT and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria.

Table 3: Spearman Correlation on Pedagogical Knowledge of ICT and Effective Teaching

	Pedagogical Knowledge	Effective Teaching
Pedagogical Knowledge	Pearson Correlation 1	.712**
	Sig. (2-tailed)	.000

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	N	43	43
Effective Teaching	Pearson Correlation	.712**	1
	Sig. (2-tailed)	.000	
	N	43	43

Table 3 revealed that the Spearman correlation coefficient of 0.712 ($p < 0.05$) indicates a strong positive relationship between teachers' pedagogical knowledge of ICT and their effective teaching of instructional technology. Since $p < 0.05$, we reject the null hypothesis, concluding that teachers' pedagogical knowledge of ICT is significantly related to effective teaching.

Hypothesis Two: There is no significant relationship between teachers' content knowledge of ICT integration and effective teaching of instructional technology in Department of Curriculum and Instruction, Federal University of Education, Zaria.

Table 4: Spearman Correlation on Content Knowledge of ICT Integration and Effective Teaching

		Content Knowledge	Effective Teaching
	Pearson Correlation	1	.763 **
Content Knowledge	Sig. (2-tailed)		.000
	N	43	43
Effective Teaching	Pearson Correlation	.763 **	1
	Sig. (2-tailed)	.000	
	N	43	43

Table 4 revealed that the Spearman correlation coefficient of 0.763 ($p < 0.05$) shows a strong positive relationship between content knowledge and ICT integration and effective teaching. Since $p < 0.05$, we reject the null hypothesis, confirming that teachers' content knowledge of ICT integration are significantly related to effective teaching.

Discussion of Findings

The finding of this study revealed that there is a significant positive relationship between teachers' pedagogical knowledge of ICT and effective teaching of instructional technology ($r = 0.712$, $p < 0.05$). This finding agrees with that of Luhamya, Bakkabulindi, and Muyinda (2017) who emphasized that pedagogical knowledge is an in-depth understanding of teaching processes such as lesson planning, classroom management, and evaluation are more effective with ICT integration. Teachers with deep pedagogical knowledge are more likely to design ICT-supported lessons that align with students' learning needs and cognitive levels. The finding also revealed that there is a strong significant positive relationship between teachers' content knowledge and ICT integration and effective teaching of instructional technology ($r = 0.763$, $p < 0.05$). This finding corroborates with that of Akturk and Ozturk (2019), who reported that teachers who exhibited solid knowledge in both Content Knowledge (CK) and Pedagogical Content Knowledge (PCK) dimensions are better adept at applying digital tools to teaching contexts.

Conclusion

The study reveals that both pedagogical knowledge of ICT and content knowledge with ICT integration are strongly linked to effective teaching of instructional technology. Specifically, content knowledge with ICT integration demonstrates stronger relationship than pedagogical knowledge emphasizing the critical role of both deep subject understanding and effective ICT integration in improving teaching outcomes.

Recommendations

Based on the findings of this study, it is recommended that:



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DOI: <https://doi.org/10.64348/zije.2026605>

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1. Universities should prioritize continuous professional development that focuses on both pedagogical knowledge of ICT and content-specific integration.
2. Workshops, seminars, and online courses should be designed to boost teachers' abilities to integrate ICT tools effectively, aligning with pedagogical strategies to improve content delivery.



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