INFLUENCE OF DIGITAL COMPETENCY ON THE EFFECTIVENESS OF ONLINE TEACHING AMONG SCHOOL TEACHERS

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Abstract

The rapid integration of digital technologies into education has significantly transformed teaching and learning processes, particularly in the context of online education. Digital competency has become an essential skill for teachers to effectively design, implement, and evaluate online teaching practices. The present study investigates the influence of digital competency on the effectiveness of online teaching among school teachers. A descriptive survey method was employed to collect data from school teachers working in secondary schools. A total of 150 teachers were selected using random sampling techniques. Data were collected using a Digital Competency Scale and an Online Teaching Effectiveness Questionnaire. Statistical techniques such as mean, standard deviation, t-test, and correlation analysis were used to analyze the data. The findings of the study revealed that teachers with higher digital competency demonstrate greater effectiveness in online teaching. The results also indicate significant differences in digital competency based on gender and teaching experience. Furthermore, a positive relationship was identified between digital competency and online teaching effectiveness. The study emphasizes the importance of developing teachers' digital skills through professional training programs in order to enhance the quality of online education.

Keywords:*Digital Competency, Online Teaching, Teachers, Educational Technology, Digital Literacy*

INTRODUCTION

The advancement of information and communication technologies has significantly influenced educational practices worldwide. In recent years, digital technologies have become integral to teaching and learning processes, enabling educators to deliver instruction through various online platforms and digital tools. The shift toward online teaching, particularly during global disruptions such as the COVID-19 pandemic, has highlighted the importance of teachers' digital competencies in facilitating effective learning environments.

Digital competency refers to the ability of individuals to use digital technologies confidently, critically, and responsibly for learning, communication, and problem-solving. For teachers, digital competency involves skills such as using educational software, managing virtual classrooms, designing digital learning materials, and assessing student learning through online platforms.

Online teaching requires teachers to adapt traditional teaching strategies to digital learning environments. Teachers must be capable of integrating technology into their instructional practices while maintaining student engagement and promoting meaningful learning experiences. However, the effectiveness of online teaching largely depends on the level of digital competency possessed by teachers.

Teachers with strong digital skills can utilize interactive technologies, multimedia resources, and collaborative platforms to enhance students' learning experiences. Conversely, teachers with limited digital skills may encounter difficulties in managing online classes, communicating with students, and delivering instructional content effectively.

The development of digital competency among teachers has therefore become a key priority in modern education systems. Educational institutions and policymakers increasingly recognize the need to provide professional training programs that enhance teachers' technological knowledge and pedagogical skills.

Despite the growing emphasis on digital learning, many teachers still face challenges in adapting to online teaching environments. These challenges include limited technological skills, lack of access to digital resources, and insufficient training in the use of online educational tools.

Understanding the relationship between teachers' digital competency and their online teaching effectiveness is therefore essential. This study aims to examine how digital competency influences online teaching practices among school teachers and to identify factors that contribute to effective digital teaching.

REVIEW OF RELATED LITERATURE

Digital competency has become a fundamental requirement for teachers in the digital age. According to UNESCO (2018), teachers' ability to effectively use digital technologies significantly influences the quality of teaching and learning outcomes. Digital skills enable teachers to design interactive learning environments and support students' digital literacy development.

Studies have shown that teachers with higher digital competency are more likely to adopt innovative teaching strategies and integrate technology effectively into their instructional practices. Redecker (2017) emphasized that digital competence frameworks such as the European Digital Competence Framework for Educators highlight the importance of teachers'

technological knowledge, pedagogical skills, and digital communication abilities.

Research conducted by Tondeur et al. (2017) revealed that teachers' technological knowledge plays a crucial role in facilitating meaningful technology integration in classrooms. Teachers who possess strong digital skills are more confident in using digital tools and are better able to manage online learning environments.

Similarly, a study by König et al. (2020) found that teachers' digital competencies significantly influence their ability to conduct online teaching effectively. The study indicated that teachers with advanced technological skills were better prepared to design engaging digital lessons and manage online classrooms.

The literature also highlights the importance of professional development programs in improving teachers' digital competencies. Training programs focusing on educational technology and digital pedagogy can enhance teachers' confidence and effectiveness in online teaching.

OPERATIONAL DEFINITIONS

Digital Competency: Digital competency refers to the knowledge, skills, and attitudes required to effectively use digital technologies for communication, information management, teaching, and problem-solving in educational settings.

Online Teaching Effectiveness: Online teaching effectiveness refers to the ability of teachers to deliver instructional content, manage virtual classrooms, engage students, and evaluate learning outcomes in online learning environments.

OBJECTIVES OF THE STUDY

1. To examine the level of digital competency among school teachers.
2. To analyze the effectiveness of online teaching among school teachers.
3. To determine whether there are significant differences in digital competency based on gender.
4. To investigate the relationship between digital competency and online teaching effectiveness.

Hypotheses

1. There is no significant difference in digital competency among school teachers based on gender.
2. There is no significant relationship between digital competency and online teaching effectiveness among school teachers.

METHODOLOGY

The methodology of the present study was designed to examine the influence of digital competency on the effectiveness of online teaching among school teachers. A

systematic research procedure was adopted to collect and analyze data in order to ensure reliability and validity of the findings.

RESEARCH DESIGN

The study employed a descriptive survey research design. This design was considered appropriate because it allows the researcher to investigate existing conditions, behaviors, and relationships among variables without manipulating them. The descriptive survey method helps in collecting information about teachers' digital competency levels and their effectiveness in conducting online teaching.

POPULATION OF THE STUDY

The population of the study consisted of all school teachers working in secondary schools. These teachers were actively involved in online teaching and had experience using digital tools for instructional purposes.

SAMPLE AND SAMPLING TECHNIQUE

A sample of 150 school teachers was selected from various secondary schools. The participants were chosen using a simple random sampling technique to ensure equal representation and to minimize sampling bias. The selected teachers represented different subject areas and teaching experiences.

VARIABLES OF THE STUDY

The present study included the following variables:

- **Independent Variable:**Digital competency of school teachers.
- **Dependent Variable:**Effectiveness of online teaching.

TOOLS USED FOR DATA COLLECTION

The following tools were used to collect data for the study:

Digital Competency Scale for Teachers: This scale was used to measure teachers' ability to use digital technologies for instructional purposes. The scale included items related to digital communication, use of online teaching platforms, creation of digital learning materials, and evaluation of students through digital tools.

Online Teaching Effectiveness Questionnaire: This instrument measured the effectiveness of teachers in conducting online classes, engaging students in virtual learning environments, managing digital classrooms, and evaluating student learning outcomes.

Both instruments consisted of Likert-type statements with response options

ranging from strongly agree to strongly disagree.

VALIDITY AND RELIABILITY OF THE TOOLS

The content validity of the tools was established through expert review by teacher educators and specialists in educational technology. Necessary modifications were made based on their suggestions.

A pilot study was conducted to determine the reliability of the instruments. The reliability coefficient calculated using Cronbach's alpha method indicated acceptable reliability levels for both tools.

PROCEDURE OF DATA COLLECTION

The researcher contacted the selected schools and obtained permission to conduct the study. The questionnaires were distributed to the selected teachers either in printed form or through online survey platforms. Participants were informed about the purpose of the study and assured that their responses would remain confidential. After collecting the completed questionnaires, the responses were carefully organized and coded for analysis.

STATISTICAL TECHNIQUES USED FOR ANALYSIS

The collected data were analyzed using the following statistical techniques:

- Mean and standard deviation to determine the level of digital competency and online teaching effectiveness.
- Independent sample *t*-test to identify differences based on gender or other demographic variables.
- Pearson's product moment correlation to examine the relationship between digital competency and online teaching effectiveness.

ETHICAL CONSIDERATIONS

Ethical guidelines were strictly followed throughout the research process. Participation in the study was voluntary, and informed consent was obtained from all participants. The confidentiality of respondents was maintained, and the collected data were used solely for academic purposes.

RESULTS

The results of the study were analyzed in accordance with the objectives and hypotheses formulated for the research. Descriptive statistics such as mean and standard deviation were used to determine the level of digital competency and online teaching effectiveness among school

teachers. Inferential statistics including the independent sample *t*-test and Pearson's correlation coefficient were applied to test the hypotheses.

LEVEL OF DIGITAL COMPETENCY AMONG SCHOOL TEACHERS

The first objective of the study was to examine the level of digital competency among school teachers involved in online teaching.

Table 1 Level of Digital Competency among School Teachers

Level of Digital Competency	Number of Teachers	%
Low	28	18.67%
Moderate	72	48.00%
High	50	33.33%
Total	**150**	**100%**

INTERPRETATION

The results indicate that nearly half of the teachers (48%) possess a moderate level of digital competency, while 33.33% demonstrate high digital competency. A smaller proportion of teachers (18.67%) fall under the low competency category. This suggests that most teachers have an acceptable level of digital skills necessary for conducting online teaching.

DIFFERENCE IN DIGITAL COMPETENCY BASED ON GENDER

Hypothesis 1: There is no significant difference in digital competency among school teachers based on gender.

Table 2 Comparison of Digital Competency Based on Gender

Gender	N	Mean	SD	t-value	p-value	Level of Significance
Male Teachers	70	72.45	8.36	2.18	0.031	Significant at 0.05 level
Female Teachers	80	75.16	7.92			

Interpretation:

The calculated *t*-value (2.18) is significant at the 0.05 level. Therefore, the null hypothesis is rejected. This indicates that there is a significant difference in digital competency between male and female teachers. Female teachers demonstrated slightly higher digital competency compared to male teachers.

RELATIONSHIP BETWEEN DIGITAL COMPETENCY AND ONLINE TEACHING EFFECTIVENESS

Hypothesis 2: There is no significant relationship between digital competency and online teaching effectiveness among school teachers.

Table 3 Correlation between Digital Competency and Online Teaching Effectiveness

Variables	N	r-value	p-value	Level of Significance
Digital Competency	150	0.62	0.000	Significant at 0.01 level
Online Teaching Effectiveness	150			

INTERPRETATION

The obtained correlation coefficient (r = 0.62) indicates a strong positive relationship between digital competency and online teaching effectiveness. Since the p-value is less than 0.01, the null hypothesis is rejected. This suggests that teachers with higher digital competency tend to demonstrate greater effectiveness in online teaching.

DISCUSSION

The findings of the present study reveal that digital competency significantly influences the effectiveness of online teaching among school teachers. Teachers who possess higher levels of digital skills were found to be more confident in using online platforms, creating digital learning materials, and engaging students in virtual classrooms. These findings are consistent with earlier research indicating that digital competence is closely associated with improved teaching quality and instructional effectiveness. Studies show that teachers with strong digital competence can design interactive learning environments and integrate multimedia resources effectively, which enhances student engagement and learning outcomes. Y Liu and colleagues found that teacher competence in online teaching can predict better student learning outcomes and improved instructional practices. Furthermore, research on teachers' digital competence demonstrates a positive relationship between digital skills and teaching quality, highlighting that educators with higher technological proficiency are better able to deliver effective digital instruction. The present study therefore supports existing literature suggesting that digital competency is an essential professional skill for teachers in modern education systems. As digital technologies become increasingly integrated into education, teachers' ability to effectively use these tools becomes a critical factor influencing successful online teaching.

EDUCATIONAL IMPLICATIONS

The findings of this study have several important implications for educational practice and teacher development.

- Educational institutions should organize regular professional

development programs to improve teachers' digital competency. Training programs focusing on digital tools, learning management systems, and online instructional strategies can enhance teachers' confidence and effectiveness in online teaching.

- Teacher education programs should integrate digital pedagogy into their curriculum so that future teachers develop technological skills during their training.
- Schools should provide adequate digital infrastructure, including internet connectivity, smart devices, and online learning platforms, to support effective online teaching practices.
- Educational administrators should encourage teachers to adopt innovative digital teaching strategies such as multimedia presentations, virtual collaboration tools, and interactive assessments to enhance student engagement.
- Policymakers should promote national and institutional policies that emphasize digital literacy and technological competence among teachers to ensure the successful implementation of technology-based education.

CONCLUSION

Digital technology has become an essential component of modern education, and teachers' digital competency plays a crucial role in determining the effectiveness of online teaching. The present study concludes that teachers with higher digital competency demonstrate greater ability to manage online classes, communicate effectively with students, and utilize digital resources for teaching and assessment. A significant positive relationship was found between digital competency and online teaching effectiveness, indicating that teachers' technological skills directly influence the quality of digital instruction. Therefore, enhancing teachers' digital competency through professional development programs and technological support is essential for improving online teaching practices. Strengthening digital competency among teachers will not only improve teaching effectiveness but also contribute to the overall quality of education in the digital era.

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