

# Correlation between the Use of Information and Communication Technology and Teachers' Job Performance: A Brief Report

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## ABSTRACT

Various factors can predict teachers' educational performance, one of which is their use of Information and Communication Technology (ICT) tools. The role of these tools in influencing teachers' performance warrants a detailed review. This study investigates the correlation between the use of ICT tools and job performance among elementary school teachers.

A descriptive cross-sectional approach was utilized for the methodology. The population included all public elementary school teachers (n=201) in the Sardroud region of Razan City, Iran, from September to November 2023. A total of 132 teachers participated in the study using a random sampling method. Two researcher-made questionnaires were utilized to gather data, each demonstrating a reliability exceeding 0.75. Consequently, the impact of ICT on teachers' job performance across cognitive, emotional, and skill dimensions was assessed.

The study's findings indicated a direct and significant correlation between teachers' use of ICT tools in the teaching-learning process of the classroom with their cognitive ( $r=0.38$ ,  $P=0.009$ ), emotional ( $r=0.48$ ,  $P=0.003$ ) and skill ( $r=0.46$ ,  $P=0.003$ ) functions.

The research findings indicate that teachers should be encouraged to incorporate ICT tools effectively into the classroom environment to improve their job performance and enhance the overall teaching and learning experience for their students.

**Keywords:** ICT tools, Work Performance, Education, Students

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## Introduction

The educational landscape is undergoing a significant transformation with the integration of Information and Communication Technology (ICT) tools in classrooms (1). These tools hold the potential to enhance teachers' job performance, ultimately impacting student learning outcomes (2).

Teachers play a pivotal role in shaping the success of educational systems (3). Their

performance is multifaceted, encompassing not only their technical skills but also their emotional intelligence and cognitive abilities. Recognizing this complexity, researchers have explored various factors influencing teacher performance, including training, evaluation methods, and job design (4).

Several studies have explored the connection between ICT use and teacher performance (5-9). Evidence suggests that teachers'

familiarity with ICT and their participation in training programs can enhance their professional empowerment (5). Additionally, a positive relationship has been observed between ICT usage and self-efficacy among employees, which often leads to improved job performance (6-9).

In the context of education, there is notable evidence that teachers' job satisfaction correlates with their performance, particularly when educational institutions adopt innovative organizational practices (10-13). Furthermore, access to ICT resources has been shown to positively influence job performance among teachers (14, 15). These findings underscore the potential of ICT to enhance teacher effectiveness and suggest that ICT can play a valuable role in improving teacher effectiveness.

Integrating ICT into pre-service teacher education has been shown to significantly enhance job-related competencies, leading to improved job performance among educators in public secondary schools (16, 17). The literature consistently supports a positive correlation between teachers' use of ICT tools and their job performance. Given the significant impact that teachers have on students' learning outcomes, it is essential to investigate this relationship more deeply in order to enhance the effectiveness of the educational system.

This study investigated the correlation between teachers' use of ICT tools and their job performance across cognitive, emotional, and skill-based dimensions. Grasping this connection is essential in the current educational environment, where the integration of ICT is swiftly changing classroom dynamics.

## Methods

### *Study Design and Setting*

This study employed a descriptive cross-sectional design to investigate the relationship between teachers' use of ICT and their job performance in public elementary schools in the Sardrood district of Razan City, Iran, from September to November 2023.

### *Participants and Sampling*

The study population included all elementary school teachers (n=201). The available sampling method was used in a chosen school, resulting in the selection of 132 individuals based on the sample size formula established by Krejcie and Morgan (18). The study involved elementary school teachers with a minimum of five years of experience who agreed to participate and completed the informed consent. Those who responded to fewer than 80% of the items on either questionnaire utilized in the study were excluded from participation.

### *Tools/Instruments*

Two researcher-made questionnaires were used to assess the correlation between teachers' use of ICT tools and their job performance across cognitive, emotional, and skill-based dimensions. The validity and reliability of each questionnaire were checked and confirmed.

#### **Teacher Job Performance Questionnaire:**

The questionnaire was developed following the framework proposed by Davae and colleagues (19), which classifies teachers' job performance into three main components: cognitive, emotional, and skill-based. It is a 20-item questionnaire based on the 5-point Likert scale. While there is no predetermined cut-off point for this questionnaire, the total scores for each participant across the different dimensions reflect their level of job performance in those areas.

**Validity and Reliability** - Davae and colleagues assert that their questionnaire possesses both face and content validity. To further substantiate this claim, the questionnaire was distributed to a panel of 15 experts, and its validity coefficient was calculated using Lawshe's Content Validity Index (20), yielding a coefficient of 0.66. This score indicates that the questionnaire meets the necessary standards for content validity. Additionally, Cronbach's alpha was employed to assess the reliability of the instrument. The finalized version of the questionnaire was administered to a sample of 100 participants,

resulting in a reliability score of 0.76 according to Cronbach's alpha, which confirms that the questionnaire exhibits adequate internal consistency.

**ICT Use Questionnaire:** To assess how teachers utilize ICT tools both in the classroom and outside of school, a questionnaire titled "Use of Information and Communication Technology" was developed by the researcher. This instrument comprises 24 items designed to evaluate various dimensions of teachers' engagement with ICT in educational settings. The responses are measured on a 5-point Likert scale, which facilitates the calculation of an overall score for each educator. The scoring range spans from 24 to 120, with a designated cut-off point set at 72.

**Validity and Reliability** – Lawshe's Content Validity Index (20) was employed to measure the validity of this questionnaire. The questionnaire was administered to 15 experts to assess its content validity, resulting in a content validity coefficient of 0.58, indicating that it meets the necessary standards. Additionally, the reliability of the questionnaire was evaluated using Cronbach's alpha, which yielded a value of 0.79 after being tested on a sample of 100 individuals. This suggests that the questionnaire demonstrates adequate internal consistency.

### Data Collection

To facilitate comprehensive participation from all selected individuals, questionnaires were distributed in person to certain participants, while others received theirs via

email. The participants' email list was acquired from the Research Deputy, and individuals received two to three reminder emails.

### Data Analysis

Indices such as minimum, maximum, median, and Interquartile Range (IQR) were used for descriptive statistics. Spearman's correlation coefficient was used for the inferential analysis of the data, which were analyzed at the 0.05 confidence level. SPSS version 26 was used for data analysis.

## Results

### Demographic Characteristics

A total of 132 teachers took part in this study, comprising 89 females and 43 males. The participants' ages varied from 28 to 56. Their educational qualifications ranged from associate degrees to master's degrees. Additionally, their teaching experience spanned from 5 to 30 years. The demographic characteristics of the participants are presented in Table 1.

### Descriptive Findings

The indices related to the central tendency and the values associated with the dispersion indices derived from the participants' responses to the research questionnaires are presented in Table 2.

Table 3 illustrates the relationship between the extent of ICT usage and various dimensions of teachers' job performance, including cognitive, emotional, and skill-related aspects.

**Table 1:** Demographic characteristics of the participants

Variables		Number	Percentage
Gender	Male	43	32.57
	Female	89	67.42
Education	Associate degree	15	11.36
	Bachelor's degree	91	68.93
	Master's degree	26	1.97
Age	28 to 40 years	45	34.09
	41 to 50 years	66	50.00
	More than 50 years	21	15.90
Teaching experience	5 to 15 years	43	32.57
	15 to 25 years	60	45.45
	More than 25 years	29	21.96

**Table 2:** Dispersion and central tendency indices for the variables examined in this research

Variables	N	Minimum	Maximum	Median	IQR*	
Using ICT tools	132	74	98	76.25	5.50	
Job performance	Cognitive	132	20	30	21.36	2.00
	Affective	132	09	15	11.11	1.86
	Skill	132	40	59	47.50	3.66

\*Interquartile Range

**Table 3:** Results of the correlation test examining the relationship between ICT usage and teachers' job performance

Teachers' job performance	Use of ICT*	
	Correlation	P value
Cognitive performance	0.38	0.009
Emotional performance	0.48	0.003
Skill performance	0.46	0.003

\*ICT: Information and Communication Technology

### Inferential Findings

Due to the non-normality of the data distribution of the research variables, Spearman's correlation coefficient was used.

As indicated in Table 3, the correlation coefficients reflecting the relationship between the utilization of ICT tools and various aspects of teachers' job performance are notably high. Specifically, the cognitive dimension shows a correlation coefficient of  $r=0.38$  ( $P<0.009$ ), while the emotional dimension has an even higher coefficient of  $r=0.48$  ( $P<0.003$ ). Additionally, the skill dimension presents a correlation coefficient of  $r=0.46$  ( $P<0.003$ ). These results demonstrate significant correlation values with confidence levels below 0.01, indicating a robust connection between the use of ICT tools and all dimensions of job performance. Consequently, it can be concluded that an increase in the application of information and communication technology tools correlates with enhancements in teachers' cognitive, emotional, and skill-based performance.

### Discussion and Conclusion

This study found a positive correlation between teachers' use of ICT and their job performance across cognitive, emotional, and skill-based dimensions. These findings align with previous research by Moreira-Fontán and colleagues, which analyzed the

structural relationships between teachers' ICT-related self-efficacy, job resources, and positive emotions, emphasizing the role of ICT in enhancing teacher engagement and performance (21).

Teachers with a firm grasp of modern educational tools and frequent ICT use tend to rely less on traditional methods like blackboards. They leverage new, computer-based approaches and digital content (e.g., PowerPoint presentations) to engage students in interactive activities. This fosters student self-awareness of learning challenges and problem-solving strategies, ultimately improving teachers' cognitive performance in the teaching-learning process, as supported by research indicating that effective ICT integration can significantly enhance student learning outcomes (22, 23). As various reports suggest, information technology fundamentally changes how students learn, reinforcing the need for teachers to adapt to these digital tools (22).

The study also suggests a positive correlation between ICT use and teachers' emotional well-being during teaching. This aligns with the findings of Chouit and colleagues, who highlighted that professors' effective use of ICT positively impacted their emotional engagement in teaching (24). Teachers with a positive attitude towards ICT and who integrate it more frequently can foster



student participation and interaction within the classroom. This two-way communication enhances efficiency and performance in the teaching-learning process, leading to greater teacher satisfaction, as noted in studies linking ICT integration with improved job satisfaction among educators (21, 25).

A crucial aspect of effective teaching is providing timely feedback to both teachers and students. ICT allows for such feedback on actions and activities, enabling quicker adjustments and planning for future programs, ultimately leading to significant progress in teaching and learning. This capability is essential for fostering an adaptive learning environment that enhances both teacher effectiveness and student achievement (23).

Furthermore, utilizing these tools enables educators to manage their responsibilities effectively, thereby mitigating the adverse effects of a challenging work environment and promoting a sense of achievement. These elements are crucial for enhancing emotional performance, increasing efficiency, and improving teaching effectiveness. Research indicates that proficient management of ICT resources can lead to notable advancements in various aspects of teachers' job performance (25, 26).

The study suggests a connection between increased ICT use and improved teacher skill performance, which aligns somewhat with the research by Comi and colleagues that found computer-based teaching methods enhance teacher effectiveness when they promote student awareness of ICT use (22).

Teachers with strong ICT skills are better equipped to perform effectively in the teaching-learning process. Additionally, using ICT in the classroom encourages teachers to adopt appropriate teaching behaviors, gaining approval from students and colleagues, which further enhances their skill performance. Overall, this study highlights the potential of ICT to improve teacher performance across cognitive, emotional, and skill-based dimensions. Further research could explore specific ICT tools and their targeted impact on various aspects of teacher effectiveness.

The current research had several key limitations. The sample size was relatively small, which could restrict the generalizability of the findings to a broader population. Future research would be enhanced by the inclusion of a larger and more diverse cohort of participants. Additionally, the study design focused on examining the correlation between variables. To gain a deeper understanding of the cause-and-effect relationship between teacher ICT use and job performance, future studies could consider implementing a longitudinal design that tracks participants over time. Finally, this study did not explore how demographic characteristics like age, gender, and teaching experience might influence the relationship between ICT use and job performance. Examining these potential moderators could provide valuable insights for future research.

Although ICT tools offer a cost-effective and efficient method for multimedia communication, their successful integration into educational settings requires that educators understand the specific functionalities of each tool and apply them strategically to achieve educational goals. This research indicates that assessing ICT competencies during the teacher recruitment process is essential, mainly due to the beneficial effects of ICT on cognitive performance in primary education. To further assist educators, schools must provide adequate ICT resources, and teachers should prioritize utilizing these tools to improve their instructional effectiveness.

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### **Authors' Contribution**

The corresponding author (FY) has overseen all components of the research process, including the research design, data gathering and analysis, as well as the preparation of the final report. FY approved the final revision of the manuscript and is fully responsible for the article.

## Conflict of Interest

The authors declare that they have no conflicts of interest to disclose.

## Ethical Considerations

The current study was conducted in accordance with the ethical guidelines established by the Payame Noor University Ethics Committee, identified by code 1/31/204 issued on 24<sup>th</sup> April 2024. Informed consent was obtained from each participating teacher, with assurances that their responses would be kept strictly confidential and utilized solely for data analysis.

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## Availability of Data and Materials

The data supporting this study's findings are available upon reasonable request from the corresponding author.

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