

Investigating the Perception of Teachers about ICT Facilities And their Role in Improving their Pedagogical Performance

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Received: 09-03-2025	Revised: 10-04-2025	Accepted: 21-04-2025	Published: 21-04-2025
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ABSTRACT

ICT is essential for enhancing the instructional effectiveness of teachers. Teachers no longer use white boards or blackboards; instead, they use projectors and online learning. The goal of this study was to investigate how ICT resources can enhance secondary school teachers' instructional effectiveness. The present study aimed to investigate the notion that a noteworthy correlation exists between instructors' educational performance and their use of ICT. This study was carried out in the Rawalpindi district's two tehsils. 1161 secondary school teachers employed in Tehsil Rawalpindi (District Rawalpindi) and Tehsil Kallar Syedan made up the entire population of the current study. Using a basic random approach, 289 teachers were included in the sample. There was a quantitative research design. SPSS version 29 was used to analyse the self-administered data collection. The use of ICT devices (printer, cell phone, projector, computer, and laptop) and teachers' pedagogical performance (design and development, academic flexibility, feedback, innovation/best practices, meeting diverse needs, student profile, teaching-learning process, and evaluation process) are found to be moderately, positively, and significantly correlated.

Key Words: *ICT, pedagogy, performance, technology, teacher*

INTRODUCTION

The term "instructional technology" refers to the process of creating, organizing, and overseeing resources to improve the efficiency of the teaching-learning process. These days, the term "instructional technology," or ICT, generally refers to the use of technology in education. The use of ICT in education has proven to be a major development endeavor over the course of many eras (Barrett et al., 2012). Vogt et al. (2008) claim that employing various strategic approaches improves the teaching and learning process when ICT is used. Students are prepared to be astute observers, creative thinkers, and problem solvers through the use of ICT. However, the achievement of this ICT goal depends on a variety of circumstances and variables pertaining to students, teachers, and ICT equipment.

The use of technology in the teaching-learning process is known as ICT integration in education (Kaware & Sain, 2015). The use of ICT in the classroom encourages student participation in class activities.

Students can learn in an environment that is tailored to their individual requirements and attention span thanks to the use of ICT in the classroom. As to Januszewski et al. (2013), educational technology refers to the process of offering students' facilities with the aim of enhancing their performance through the use of technological equipment in the educational domain. Mangal et al. (2019) define it as the thoughtful application of all available resources, with the aim of resolving the fundamental issues encountered in the field of education.

Schools that use contemporary technologies in the teaching-learning process are actually outperforming other educational establishments in the twenty-first century. These days, technological tools like computers and projectors are used in schools to boost student learning as well as the teaching abilities of the faculty (Shuba, 2016). The most advanced schools in the United States of America use technology to enhance the teaching process, update the grading scheme, give kids an amazing educational experience, and communicate with the parents. Teachers are now implementing particular teaching strategies that were out of style before ICT was introduced into the classroom.

Even though radios were initially used in classrooms in the 1920s, teachers were already familiar with technological gadgets by then. However, we can argue that the true use of ICT in education began in the 1990s, with the goal of assisting teachers in their work (Cuban, 1993). ICT appears new, but it isn't; it has long been an essential component of the teaching-learning process. Technology quickly became a component of schools as it was introduced to the market. Abacus was a technological innovation in the past that aided instructors in the classroom, long before television, computers, the internet, and other devices were created. Many antiquated technologies are still utilized in schools today in one form or another, but computers and computer-assisted learning methods are the most significant technologies utilized in classrooms nowadays. We are thankful to ICT for enabling our pupils to participate enthusiastically in class and to take an interest in what they are learning.

Instructors use ICT for a variety of reasons, including maintaining administrative and managerial tasks like monitoring student progress, offering engaging lectures and presentations, and supporting learner-centered activities like offering students a choice in how to share their knowledge (Palau et al., 2021). The ICT studies that support efforts to integrate ICT into education have encouraged teachers to use technology, but it primarily serves administrative needs rather than instructional ones (Harper et al., 2016).

Additionally, teachers with similar levels of ICT proficiency may use technology in the classroom in different ways. For example, some teachers use interactive whiteboards or SMART boards only to display content, while others prefer to use technology to support problem-based, investigative, or interactive learning (Hall, 2010; Gregorcic et al., 2017). Some people utilize ICT to teach online, while others use projectors to teach in-person. Modern classrooms are supported by technological advancements that provide teachers access to everything they need for instruction right at their doorstep.

The main goal of the current study is to find out how ICT resources might help teachers perform better pedagogically. It is impossible to dispute the importance of ICT for pedagogical performance in an educational setting. This study primarily focusses on the ICT-based pedagogical performance of Punjabi instructors in Pakistan.

LITERATURE REVIEW

ICT is a broad field that includes many tools and materials linked to the field of education. According to Kuar (2015), integrating ICT into the classroom is thought to be essential to society's full participation. ICT is used in many different domains, including business, economics, education, healthcare, and personal services. ICT has a very broad and profound function in education; it is now a necessary component of the teaching-learning process. ICT enhances teaching abilities in the field of education

(Meenakshi, 2013). In addition, Sarkar (2012) notes that sustainability, equal distribution of ICT capital, managerial challenges, and economic concerns have all been significant determinants of ICT integration in education.

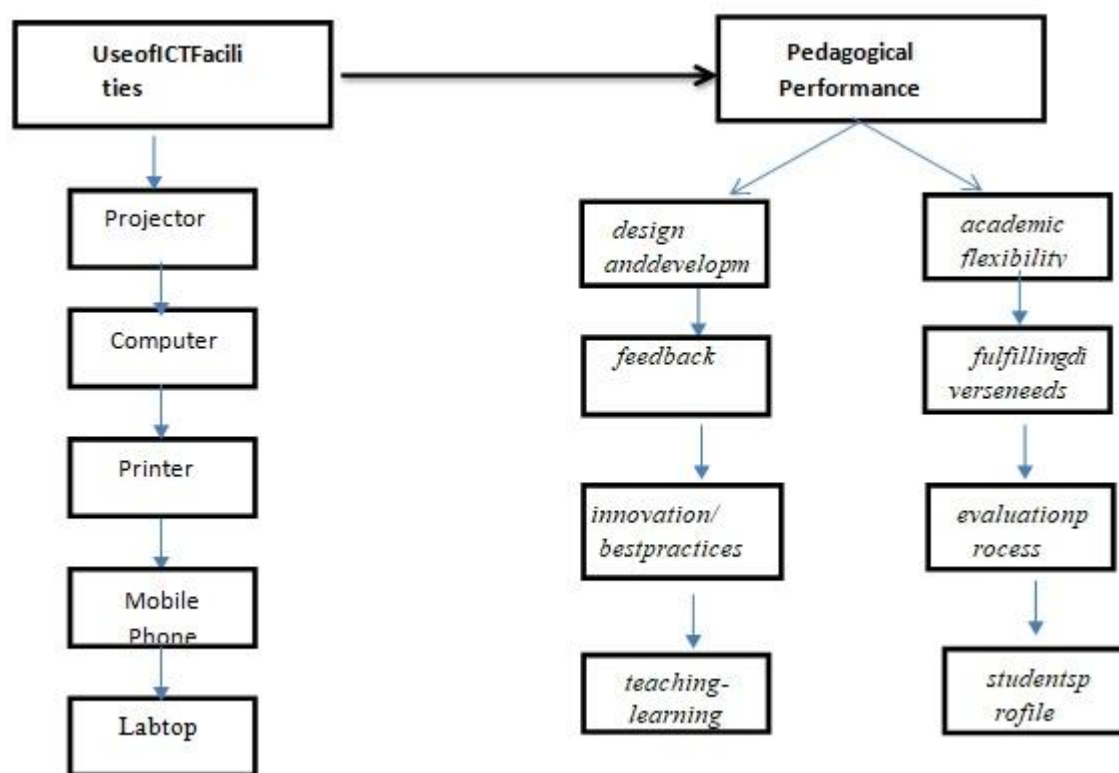
Three prominent educators were highlighted by Norman (1999), including Thomas Edison (1922) who mentioned the use of pictures, word searches, and textbooks in the classroom, Williams Leveson (1945) who suggested using radio receivers in place of blackboards in the classroom, and B.F. Skinner (1960s) who believed that new ICT devices would greatly increase students' curiosity about learning. In a similar vein, Shirley, Jennifer, and Philip (2007) clarified that the introduction of computers into the classroom between 1991 and 1994 changed the conventional wisdom in the field of education.

According to Lebedev (2010), scientific advancements in education occurred between the 1990s and 2000s, and these were followed by Moore's Law, which stated that computers doubled efficacy every two years. Similarly, a survey conducted by Robertson, John et al. & SoutherLand (2009) found that the use of ICT in education has increased significantly since 2005.

The global increase in the number of graduates and degree holders is primarily due to the use of ICT and computers. ICT has made it possible for educational establishments to establish a setting where students can thrive and advance their education. There are now more doctors of philosophy as a result of it. University administrators had to provide their faculty with the tools and guidance they required to teach large classes of students and raise the bar for education globally (Shirley et al., 2007). These days, the success and development of an institution depends on how they use technology. Teachers' ability to provide hypothetical and sensible instructions improved with their ICT proficiency. ICT integration in vocational education is becoming more and more necessary to improve the quality of instruction (Tamim et al., 2011).

Pakistan, like other industrialised nations, is working to integrate technology into the classroom. Educational institutions that can use ICT effectively are starting to collect large numbers of skilled officials in order to meet worldwide standards (Ali and Proctor, 2005). The Higher Education Commission, or HEC, is putting special emphasis on developing and training university faculty members in accordance with worldwide standards. (HEC 2010) states that in order to compete on a global scale, a country must recognise the importance of integrating technology into the classroom. In order to satisfy worldwide standards for the use of technology in education, HEC has launched a number of programs, including research centres, national digital libraries, video conferencing, networking institutions, and scholarships for researchers to travel overseas.

COCEPTUALFRAMEWORK



RESEARCH METHOD

Research Design

The researcher used a quantitative research approach and a descriptive research methodology in this investigation. A descriptive study strategy is more suited for providing an accurate and methodical description of a phenomenon. Since the quantitative technique is a more practical means of gathering data from a larger group, it can be applied to a broad population and offers analysis of data in tabular and graph form.

Population

A population is defined as the group of individuals that are the subject of the investigation. The number of secondary school teachers in Tehsil Rawalpindi and Tehsil Kallar Syedan (Punjab, Pakistan) that teach high school and higher education was the focus of the current study. Eleven hundred and sixty-one (1161) secondary/high school teachers (SST/SSE) employed in Tehsil Rawalpindi and Tehsil Kallar Syedan (Distt Rawalpindi) were the target population.

Sample and Sampling Technique

Using Krejcie and Morgan's Table of Sampling (1970) and a basic random sample technique, the researcher picked 289 secondary school teachers as a sample from the intended population.

Research Instrument

The outcome of the current investigation used a self-structured questionnaire. The researcher created a questionnaire with a five-point Likert scale to collect respondents' responses.

Validity and Reliability of the Instrument

Five subject matter experts were given access to the structured questionnaire so that researchers could validate it. The researcher was able to enhance the questionnaire's internal consistency with the assistance of these experts' recommendations. The researcher used SPSS version 25 to determine the Cronbach's Alpha model in order to assess the questionnaire's internal consistency reliability. According to the analysis, the questionnaire's Cronbach's Alpha rating of 0.965 indicated its reliability for use in subsequent data gathering steps.

Data Collection

Following official authorization from higher authorities, in-person meetings were scheduled to engage with the respondents directly and ensure that the information they provided in the questionnaire was understood accurately. Filling out the questionnaire required more than one visit. In order to gather fully completed questionnaires, the researcher had to make multiple trips to the chosen schools. The following is a summary of the information gathered:

Table 1

Summary of Collected Data

	Targeted Population		Questionnaire Distributed	Completely Filled	Partially Filled
		Sample			
Kallar Syedan	199	50	50	49	1
Rawalpindi	962	239	239	237	2
Total	1161	289	289	286	3

Data Analysis

The disjointed data that was gathered from the respondents was coded and arranged before being loaded into SPSS version 25 for analysis. Using SPSS, the researcher computed the following data: frequency, percentage, mean, mode, median, correlation coefficient, and standard deviation.

RESULTS

Table 2

Usage of ICT Devices Per Week

	Once	Two Times	Three Times	Four Times	Daily	Total Usage %
Projector	16.9	6.9	18.7	3.5	6.9	52.6
Printer	20.4	1.7	39.4	5.5	6.6	73.7
Laptop	10.7	0.7	30.8	12.5	9	63.7
Mobile Phone	13.8	5.9	31.1	22.1	6.2	79.2
PC	11.4	0.7	34.3	10.7	11.4	68.5

The aforementioned investigation details how secondary school instructors use ICT tools (such as projectors, laptops, computers, mobile phones, and printers) in their instruction. In summary, 52.6% of secondary school teachers use projectors; 63.7% use laptops; 68.5% use computers; 79.2% use mobile phones; and 73.7% use printers when instructing students. It is often true that secondary school teachers use their phones more frequently than their printers.

Table 3

Correlation between Usage of ICT and Pedagogical Performance

	Usage of ICT	Pedagogical Performance of Teachers

	Pearson Correlation	1	0.379**
Usage of ICT	Sig. (2-tailed)		0.009
	N	289	289
	Pearson Correlation	0.379**	1
Pedagogical Performance of Teachers	Sig. (2-tailed)	0.009	
	N	289	289

Table 3 shows that there is a 0.379 association between instructors' pedagogical performance and their use of ICT. A score of less than 0.40 indicates a poor correlation between the two variables. Thus, it may be concluded that there is a positive, if slight, correlation between instructors' educational performance and their use of ICT. The fact that p is 0.009 ($p < 0.05$) indicates that there is a substantial correlation between the two variables.

It was vital to examine the relationship between each pedagogical performance metric and ICT usage in order to gain comprehensive understanding. So, a thorough analysis was conducted. To do this, the sum of the ICT consumption was calculated using the frequency of utilization of the various ICT devices described above. In a similar manner, the sum for each of the following pedagogical performance variables was calculated: Design and Development, Academic Flexibility, Feedback, Innovation/Best Practices, Students' Profile, Fulfilling Diverse Needs, Teaching Learning Process, and Evaluation Process. Each pedagogical performance variable was then correlated. Calculations were made to determine the significant value and Pearson Correlation values.

Table 4

Correlations between Usage of ICT and Design and Development

	Usage of ICT		Design and Development
	Pearson Correlation	1	0.455**
Usage of ICT	Sig. (2-tailed)		0.008
	N	289	289
	Pearson Correlation	0.455**	1

DesignandDevelopment	Sig.(2-tailed)	0.008	
	N	289	289

The correlation coefficient between ICT use and design and development is calculated, as shown in Table 4. According to the table, there is a positive association ($r = 0.455$) between Design and Development and ICT Usage. The moderate relationship between the two variables is shown by the value between 0.4 and 0.6. Thus, it can be concluded that there is a moderately beneficial relationship between secondary school teachers' use of ICT and their design and development of curricula. The fact that the p-value is 0.008 ($p < 0.05$) indicates a substantial relationship between the two variables.

Table5

Correlation between Usage of ICT and Academic Flexibility

		Usage of ICT	Academic Flexibility
Usage of ICT	Pearson Correlation	1	0.312**
	Sig. (2-tailed)		0.000
	N	289	289
Academic Flexibility	Pearson Correlation	0.312**	1
	Sig. (2-tailed)	0.000	
	N	289	289

The summary of the correlation analysis between Academic Flexibility and ICT Usage is shown in Table 5. The findings indicate that there is a positive link ($r = 0.312$) between academic flexibility and ICT use. The relationship is shown as weak when the value of r is less than 0.40. Thus, it may be concluded that there is a weak but favorable correlation between academic flexibility and ICT usage. A more thorough analysis reveals that the significance value is $p < 0.01$, indicating a highly significant association between the two variables. In summary, there is a small but statistically significant correlation between academic flexibility and ICT usage.

Table6

Correlation between Usage of ICT and Feedback

		Usage of ICT	Feedback
Usage of ICT	Pearson Correlation	1	0.315**
	Sig. (2-tailed)		0.007
	N	289	289
Feedback	Pearson Correlation	0.315**	1
	Sig. (2-tailed)	0.007	
	N	289	289

The computed correlation coefficient between ICT Usage and Feedback is displayed in Table 6. The correlation value between the two variables, according to the data, is 0.315. A value of less than 0.40 indicates a poor correlation between the variables. Thus, it may be concluded that there is a weak but favorable correlation between ICT use and feedback. The extremely significant link between these two variables is indicated by the significance value of $p < 0.1$. To summarize the information above, it can be stated that there is a weak but positive correlation between ICT usage and feedback.

Table7

Correlation between Usage of ICT and Innovation/Best Practices

		Usage of ICT	Innovation/Best Practices
Usage of ICT	Pearson Correlation	1	0.499**
	Sig. (2-tailed)		0.000
	N	289	289
Innovation/Best Practices	Pearson Correlation	0.499**	1

Sig. (2-tailed)	0.000	
N	289	289

The summary of the computation of the link between ICT usage and innovation/best practices is shown in Table 7. The findings indicate that there is a moderate but positive correlation between the use of ICT and innovation/best practices, with a correlation coefficient between the two values of 0.499. The outcome additionally demonstrates that the significance value is $p < 0.01$, indicating a very strong correlation between the two variables. In summary, there is a positive, significant, and moderate association between teachers' adoption of innovative and best practices in the classroom and their use of ICT.

Table8

Correlation between Usage of ICT and Student Profile

		Usage of ICT	Student Profile
Usage of ICT	Pearson Correlation	1	0.405**
	Sig. (2-tailed)		0.000
	N	289	289
Student Profile	Pearson Correlation	0.405**	1
	Sig. (2-tailed)	0.000	
	N	289	289

The computed correlation coefficient between ICT usage and student profiles is shown in Table 8. The outcome reveals that the correlation value between the two variables is 0.405, indicating a positive and moderate association between the creation and updating of students' profiles on ICT and their use of it. The outcome additionally demonstrates that there is a highly significant association between the two variables, with a significance value of $p < 0.01$. In summary, there is a moderately strong, positive, and significant correlation between upgrading students' profiles and ICT usage.

Table9

Correlation between Usage of ICT Fulfilling Diverse Needs

		Usage of ICT	Fulfilling Diverse Needs
Usage of ICT	Pearson Correlation	1	0.268**
	Sig. (2-tailed)		0.009
	N	289	289
Fulfilling Diverse Needs	Pearson Correlation	0.268**	1
	Sig. (2-tailed)	0.009	
	N	289	289

The correlation coefficient between the use of ICT and meeting diverse needs is calculated and shown in Table 9. The outcome reveals that the correlation coefficient (r) is 0.268. It is possible to conclude that there is a weak but positive association between the use of ICT and meeting a variety of needs because a value less than 0.4 indicates a weak relationship. Additionally, the result indicates that there is a significant association between the two variables, with a significance value of 0.009. In summary, there is a small but substantial beneficial association between secondary school teachers' use of ICT and their ability to meet a variety of needs.

Table10

Correlation between Usage of ICT and Teaching Learning Process

		Usage of ICT	Teaching Learning Process
Usage of ICT	Pearson Correlation	1	0.411**
	Sig. (2-tailed)		0.007

	N	289	289
	Pearson Correlation	0.411**	1
Teaching Learning Process	Sig. (2-tailed)	0.007	
	N	289	289

The correlation coefficient between ICT usage and the teaching and learning process is calculated and shown in Table 10. The correlation value of 0.411 in the result indicates a moderately good association between ICT usage and the teaching and learning process. The outcome additionally indicates that the association is highly significant, with a significance value of 0.007. In summary, there is a strong, favorable, and moderate correlation between ICT use and the teaching and learning process.

Table11

Correlation between Usage of ICT and Evaluation Process

		Usage of ICT	Evaluation Process
	Pearson Correlation	1	0.464**
Usage of ICT	Sig. (2-tailed)		0.003
	N	289	289
	Pearson Correlation	0.464**	1
Evaluation Process	Sig. (2-tailed)	0.003	
	N	289	289

The correlation coefficient summary between ICT usage and the evaluation process is displayed in Table 11. The findings indicate a moderately favorable association between the two variables, with a correlation value of 0.464. The outcome also reveals a very significant association between the two variables, with a significance value of 0.003. In summary, the association between ICT usage and the evaluation process is noteworthy, favorable, and modest.

DISCUSSION

The study found a correlation between instructors' educational performance and their use of ICT. The use of ICT devices (printer, projector, laptop, mobile phone, computer) and teachers' pedagogical performance (design and development, academic flexibility, feedback, innovation/best practices, meeting diverse needs, student profile, teaching-learning process, and evaluation process) are found to be weakly, significantly, and positively correlated. There hasn't been much evidence of a substantial association. This could be because Punjabi schools' curricula haven't been updated enough to enable full integration of ICT gadgets to enhance the teaching-learning process. Despite this, the results of the current study indicate that teachers' pedagogical performance is improved when they use ICT gadgets.

According to numerous earlier research (Zafar & Ulla, 2020; Legendre, 2020; Raja et al., 2018; Fered et al., 2022; Ergado, 2019; Muhtadi et al., 2020; Khaliq, 2017; Shah et al., 2020), the results of the current study are consistent with each other. According to Zafar and Ulla (2020), using digital gadgets promotes teachers' motivational behaviour, instructional effectiveness, and professional development. According to Legendre (2022), the use of ICT by teachers facilitates globalisation, parent-student contact, professional development, curriculum creation, and feedback-giving. The new study's findings are consistent with the research indicated above and provide deeper, in-depth understanding of the function of ICT use in the classroom, particularly in Pakistan.

CONCLUSIONS

The use of ICT devices (printer, laptop, computer, projector, and mobile phone) and measures of pedagogical performance (design and development, academic flexibility, feedback, innovation/best practices, meeting diverse needs, student profile, teaching-learning process, and evaluation process) is found to be positively, significantly, weakly, and occasionally moderately associated.

RECOMMENDATION

The following recommendations can be made based on the findings of the current study:

- In order to improve student outcomes, educators could receive the necessary training to incorporate ICT into their daily lesson plans.
- Schools in underprivileged areas might have readily usable ICT equipment, such as computers and laptops.

- To relieve teachers of file labour, the online profiling and data system might be pushed.

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