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Analysis of the Teachers' Perceptions about the Integration of Information and Communication Technology (ICT) in Teaching Learning Process. A case of University of Swat, Khyber Pakhtunkhwa.

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Information and communication technology is an important field role in teaching and learning. It is a field not limited to the industry and communication only rather it has spread its Importance to every field in the modern world. Similarly, teaching is no more limited to the white board teaching only. Teachers use variety of the methods to impart learning to the students. This results in not only catching students' attention effectively but also learning has been lot made easier through different application and online tools and virtual platforms. Learning and knowledge has gone beyond the narrow confines of classrooms. Looking into the importance of ICT this study was undertaken in order to find out the teachers' perception of the use of ICT in teaching learning process. A sample of 96 male and female teachers was calculated through Raosoft online calculator. The data was analyzed through inferential and descriptive statistics, using Chi-square T-Test, Enova and frequencies, percentage, means and standard deviation respectively. However, the teachers showed some concerns over the use of ICT. There were some issues like the lack of ICT labs, connectivity, teachers' confidence and short duration to finish the courses in.

1. Introduction

Numerous facets of our way of life have undergone major transformation as a result of information and communication technology (ICT). Numerous industries are greatly impacted, including banking, engineering, medical, tourism, business, law, education, and student learning. ICT has had a significant impact over the last two to three decades. The fast advancement of technology has caused these areas to operate very differently now than they did in the past (Poongodi et al., 2021). Compared to other fields, education seems to have had significantly less change and influence (Pramanik, 2011; Pramanik & Jana, 2023). But education, which also puts a nation on the correct path for economic success and helps it become technologically imaginative, is one of the most important investments in a country's human capital. ICT has grown and developed quickly, which has led to the proliferation of technology in education (Gulbahar & Guven, 2008; Guven & Gulbahar, 2020). Global educational institutions are quickly integrating new ICT technologies into their curricula to provide students with the information and abilities they need for the twenty-first century (Hue & Ab Jalil, 2013; Shah, 2020). Numerous scholars have emphasized how important it is to employ them in order to raise the bar for instruction and learning (Akdere & Egan, 2020).

The use of information and communications technology has been recognized by governments and educational institutions as a crucial problem for enhancing instruction's effectiveness (Plump et al., 2009; Chisango et al., 2020). Sahin-Kizil (2011) and Rababah (2020) conducted a review of the research demonstrating the positive impacts of ICT use in the classroom on student motivation, active learning, the availability of useful resources, and information access. Furthermore, Wang and Woo (2007); Yılmaz & Yılmaz (2023) looked at the enormous potential that technology has to increase student engagement, provide connections to a variety of information sources, support collaborative learning, and free up teachers' time for classroom facilitation. As a result, integrating ICT into teaching and learning is a major issue for many educators (Fenta and Gebremedhin, 2015; Seifu, 2020).

Technology is rapidly changing people's daily lives while simultaneously improving them in many other ways (Marvin, 1997; Macrorie et al., 2021). These days, living in a worldwide society involves a lot of technology, which also advances social life (Wilson, 2003; Diwanji et al., 2020). In spite of its dynamic framework, technology is still advancing, and social life has a big influence on educational institutions (Watson, 2001; Dahiya et al., 2022)). With the introduction of computers in education, one of the most important technologies of the twenty-first century, it is reasonable to say that computer technology plays a major role in today's classrooms (Lai & Pratt, 2004; Mensah & Osman, 2022). The increasing use of computers in education has put pressure on governments to properly integrate information and communication technologies (ICT) into their educational systems in recent years (Tondeur, van Keer, van Braak, & Valcke, 2008; Ferede et al., 2022). Thus, it is possible to comprehend the barriers to a successful integration of ICT into the teaching and learning process by closely examining instructors' perceptions.

Because this study focuses on ICT practices, it provides further recommendations to the university administration, college deans, and teachers for how technology may be used at different levels to improve the teaching-learning process. ICT can reach target populations with limited access to traditional education and training, changing the learning environment and helping to improve the quality of instruction. ICT brings together educational technologies that were previously dispersed, such as databases, books, writing, phones, and photography. Consequently, it establishes links between various forms of information and intersects various learning contexts, including family, work, and community. The study's conclusions offer crucial suggestions for opening up ICT infrastructure so that educational establishments and curriculum can connect to the resources of developing networks. Following are the objectives of the research.

1. To find out how instructors feel about using ICT into the teaching and learning process.
2. Determine the connection between the efficiency of the teaching and learning process and the incorporation of ICT.
3. To look into areas for improvement in the way that ICT is integrated into the teaching and learning process.

2. Literature Review

2.1 Information and communication Technology

Information and communication technology, or ICT, is the term for the diverse range of tools and technologies used for information assembling, storing, repossessing, processing, relocating, and sharing. It includes several hardware, programs, networks, and services that make data management and transmission possible. Computers, servers, routers, cellphones, and other electronic devices are examples of physical ICT devices. ICT also denotes the software programs and operating systems that run on the device. It also includes the networks and infrastructure, such as the internet, wireless networks, and telecommunications systems, which make it easier to convey information. The term ICT emphasizes the blending of information processing and communication technologies, highlighting the areas' interdependence and convergence. It understands that information is valuable not only in and of itself, but also essential for effective decision-making and communication.

2.2 ICT integration in teaching for teachers

The use of ICT in the classroom has got into practice significantly in contemporary education. According to research (Mishra & Koehler, 2006; Ertmer, Ottenbreit-Leftwich, & York, 2007), integrating ICT resources into teaching can improve, students' learning participation, and the general classroom involvement. To build rich and interactive learning classroom situations, teachers can use divers ICT tools, including interactive whiteboards, educational applications, online cooperative tools, and multimedia resources (Puentedura, 2014). According to studies, when teachers efficiently use ICT into their lessons, students' creativity, critical thinking, and problem-solving abilities increase (Voogt et al., 2013). Similarly, according to Akram et al., (2022), the rapid expansion of the Information and Communication Technologies (ICTs) has transformed learners into digital learners, requiring teachers to integrate technology into their pedagogical approaches, where

teachers' attitudes, technological knowledge, and skills play a significant role in its effective integration. However, teacher preparation and professional development are necessary for effectiveICT integration. In order to use ICT effectively and in line with learning objectives, teachers must improve their digital literacy abilities and modify their pedagogical approaches (Law, Yuen, & Chan, 2016).

2.3 Analysis of Policies for ICT in Education

The IEA is an international organization for evaluating educational achievement. This research offers a thorough examination of international policy for ICT integration in education. Itcovers both the positive and negative effects of ICT on teaching and learning. (Kozma 2008).

2.4 ICT in Education Toolkit

A comprehensive manual created to help policymakers, educators, and school administrators improve the integration of Information and Communication Technology (ICT) in educational settings, this toolkit was released by UNESCO in 2013. This resource covers a wide range of crucial topics, including curriculum creation, teacher preparation programs, infrastructural needs, and policy development. It does so while acknowledging the changing importance of technology in education. It offers helpful suggestions and methods for utilizing ICTsuccessfully, guaranteeing that kids get a top-notch education that will prepare them for the digitalage (UNESCO, 2023).

2.5 Flexible Learning in a Digital World

Information and communication technology (ICT) is discussed in the book "Flexible Learning in a Digital World Expectations and Experiences" by Moonen and Collis (2001) as it relates to adaptive learning settings. The authors examine how ICT might support and improve several facets of education, such as group projects, student-centered instruction, and individualized learning opportunities. The book probably covers how ICT resources and digital tools promote collaboration among students and between students and teachers. It might go over the benefits of using collaboration software, video conferencing, and internet communication in the creation of interactive learning environments. Additionally, it is anticipated that the book will explore the idea of student-centeredlearning, highlighting the significance of customizing educational experiences to match each student's needs and preferences. It can go over how technology might provide students the chanceto be more in charge of their education and interact with the material in a way that works for them.

Furthermore, the book might discuss the idea of customized learning experiences, which entails tailoring the educational material, tempo, and assessment to each learner's particularneeds. The book is helpful for academics and researchers who want to know how to use technology to design flexible, student-centered, and individualized learning environments in the digital age. (Moonen and Collis 2001).

2.6 International Handbook of Information Technology in Primary and Secondary Education

A thorough resource that offers an overview of the most recent research and best

practices for integrating Information and Communication Technology (ICT) into primary and secondary education is the International Handbook of Information Technology in Primary a Secondary Education, written by Voogt and Knezek (2013). Online learning, digital literacy, teacher professional development, and the usage of educational gaming in educational contexts are just a few of the subjects covered in this handbook (Voogt & Knezek, 2013).

2.7 ICT Integration in Education

ICT (information and communication technology) integration in education there been topic of rising attention and significance throughout Latin America. Effective ICT integration tactics are discussed by Hepp et al. (2016) in the context of Latin American educational settings. A number of important facets of this subject are highlighted in their book. The effect of ICT integration on students' learning outcomes is highlighted by the writers. They look at how using digital tools and technologies can improve learning by making itmore interactive and engaging. There are probably instances and research findings in the book thatshow how integrating ICT has a positive impact on student engagement and accomplishment. However, according the research conducted by Lomos et al. (2023) to "the availability of Internet, hardware, and software are initially necessary, but need to be complemented by empowered schools and educational communities".

The book also explores the importance of teacher preparation for successfully integrating ICT into the classroom. It probably talks about how instructors need help and trainingto use technology as a teaching tool effectively. This calls for both technical know-how and pedagogical understanding on how to best incorporate ICT into the curriculum to reap its benefits. The policy frameworks relating to the integration of ICT in education are likely covered by Hepp et al. (2016). They can talk about how crucial government regulations and educational institutions' plans are for fostering an atmosphere that supports successful ICT integration. Policies that encourage the efficient use of technology in the classroommay have to do with infrastructure development, finance, and curriculum design.

3. Research Methodology

This study employed a quantitative research approach to ascertain teachers' perspectives regarding the incorporation of ICT in the process of teaching and learning. Teachers' perceptions and demographic data are among the various dependent and independent variables in the study. There were 136 faculty members in the study population—16 of whom were female and 133 of whom were male. Using the Rao Soft online calculator, the sample size was calculated to be 96 faculty members out of the overall population of 136. As a result, data will be collected from 96 faculty members out of the total population. A Likert-Scale questionnaire was also employed in the questionnaire's development. The questionnaire focused on the attitudes, experiences, and perceived advantages and disadvantages of ICT integration among instructors. Inferential and descriptive statistics were used to analyze the data; Chi-square T-Test, Enova, and frequencies, percentages, means, and standard deviation were used, respectively.

Analysis of the data

A Likert scale questionnaire was used to collect the data, and descriptive statistics like percentage, mean scores, and standard deviation were utilized to analyze the results.
These were the criteria that went into the mean score;

SA = 5.00 to 4.51

A = 4.00 to 3.51

UD = 3.50to 2.51

DA = 2.50to 1.51

SDA= to 1.00
1.50

Table No 1: Gender

		Frequency	Percent	Valid percent	Cumulative Percent
Valid	Male	83	86.5	86.5	86.5
	Female	13	13.5	13.5	100.0
	Total	96	100.0	100.0	

Table no 1 The frequency and percentage of males and women are known to us. The gender distribution of the sample is shown in the table. The number of individuals in each category is indicated in the "Frequency" column, where there are 83 men and 13 women. The gender distribution in the sample is displayed in the "Percent" column, with men accounting for 86.5% of the total and women for 13.5%. The "Valid Percent" column displays the percentage of each gender among all valid responses, which is 100% for both males and females. The "Cumulative Percent" column displays the cumulative percentage for each gender, with males accounting for 86.5% and females for 100% of the total cumulative percentage.

Table 2, the data on the frequency and proportion of various academic positions in a sample are shown in the table that is provided. We can see how many people fall into each groupin the "Frequency" column: there are 46 lecturers, 48 assistant professors, and 2 associateprofessors. There were 96 responders in all. The percentage of each academic job in the sample isshown in the "Percent" column. Assistant professors make up 50.0%, associate professors 2.1%, and lecturers 47.9% of the total. The percentage of each academic position among all valid responses is shown in the "Valid Percent" column. Of the genuine responses,

Associate professors make up 2.1%, lecturers 47.9%, and assistant professors 50.0%. The "Cumulative Percent" column displays the cumulative percentage for each academic post. Associate and assistant professors make up 97.9% of the total percentage, with lecturers making up 47.9%. The total cumulative percentage is 100.0%.

Table No 2: Post

Frequency			Percent	Cumulative	Valid percent
Valid	Lecturer	45	47.9	47.9	47.9
	Assistant professor	49	50.0	50.0	97.9
	Associate professor	3	2.1	2.1	100.0
Total		95	100.0	100.0	

Table No 3: Qualification

		Frequency	Percent	Valid percent	Cumulative percent
Valid	MS/MPhil	32	32.3	32.3	32.3
	PhD	64	67.7	67.7	100.0
Total		96	100.0	100.0	

Table 3 provides information on the frequency and percentage of educational backgrounds in a sample. The "Frequency" column lists the number of individuals who meet each requirement; 31 have an MS/MPhil and 65 have a PhD. In total, 96 people responded. The "Percent" column displays the percentage of each qualification in the sample. Those with an MS/MPhil account for 32.3% of the total, while those with a PhD account for 67.7%. The "Valid Percent" column displays the percentage of each qualification among all valid responses. Of the valid responses, 32.3% were from MS/MPhil holders, while 67.7% were from PhD holders. The "Cumulative Percent" column displays the cumulative percentage for each qualification. Owners of PhD holders make up 100% of the total cumulative percentage, while those with an MS/MPhil degree make up 32.3% of the cumulative proportion.

Table 4 The table displays information on the frequency and percentage of different faculties in a sample. We can see the amount of people in each faculty category in the "Frequency" column. The Social and Management Faculty comprises 33 members, the Religious and Legal Studies Faculty comprises 11, the Physical Sciences Faculty comprises 34, and the Numerical Sciences Faculty comprises 18. There are 96 responders in all. The percentage of each faculty member in the sample is shown in the "Percent" column.

Table No 4: Department

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Social and management Faculty	34	34.3	34.3	34.3
	Religious and legal studies faculty	12	11.6	11.4	45.7
	Physical sciences faculty	33	35.3	35.5	81.3
	Numerical sciencesfaculty	17	18.9	18.7	100.0
	Total	96	100.0	100.0	

Table No 5A: To investigate the teachers' perceptions about the integration of ICT in teaching and learning process.

S no.	Statement	Mean	Std. Deviation
1	ICT enhances student engagement in the classroom	4.17757	.40175
2	The availability of ICT resources in my department facilitates effective teaching	4.2135	.45583
3	I feel confident in my ability to use ICT toolsfor teaching	4.3505	.50773
4	ICT helps in delivering diverse and interactive learning materials	4.3703	.44117
5	ICT integration enhances students' understanding of complex concepts	4.3818	.57887
6	The training and support provided for ICT use in teaching are sufficient	2.4124	.88630
7	ICT integration requires too much time and effort on my part	2.4207	.94009
8	The department ICT infrastructure is reliable and up-to-date	2.12776	.75677

The data in Table 5- A pertains to the average and standard deviation of a series of statements that were used to look into how instructors felt about the use of ICT (information and communication technology) in the classroom. It can be seen from the mean values that teachers generally have favorable opinions about the incorporation of ICT. Because their department has ICT resources available, they feel that ICT improves student involvement in the classroom (mean = 4.1667) and makes effective teaching easier (mean = 4.1146). Furthermore, instructors have faith in their capacity to employ ICT tools for teaching (mean: 4.2604), and they understand the benefits of ICT in terms of offering a range of interactive

learning resources and enhancing students' understanding of challenging subjects (mean: 4.2917).

Some locations still have a need for labor. Teachers' perceptions of the ICT use in teaching training and the support provided are indicative of the need for more comprehensive help in this area (mean = 2.3125). Furthermore, instructors feel that integrating ICT takes up too much of their time and energy (mean = 2.5208), suggesting that they may find it challenging to manage the workload associated with integrating ICT. Instructors' express concerns about the department's ICT infrastructure's upkeep and dependability as well (mean = 2.2187), emphasizing the necessity for advancements in this field.

Table No 5-B: Find out the relationship of ICT integration and the effectiveness of teaching and learning process.

S no.	Statement	Mean	Std. Deviation
9	ICT tools are regularly used in my educational institution	2.8583	1.08499
10	The teachers effectively incorporate ICT into their teaching methods	3.5375	1.02405
11	I have access to up-to-date ICT resources in my learning environment	3.7229	.85833
12	The use of ICT has Enhanced my understanding of course material	4.2458	.52273
13	The use of ICT has improved my engagement in the learning process	4.0838	.50426
14	Overall, the integration of ICT has positively impacted my educational experience	4.1671	.88252
15	In my opinion, has ICT integration improved Student engagement	4.1145	.64677
16	Do you believe that ICT integration has improved the academic performance of the pupils	4.1340	.58490

A series of assertions about the integration of ICT (information and communication technology) in educational institutions and its effect on the efficiency of the teaching and learning process are shown in Table 1.6 together with their respective means and standard deviations.

The regular use of ICT tools at the educational institution has a relatively lower mean score (2.9583) based on the mean values, which suggests that it might not be implemented consistently. The teachers' mean score for how well they integrated ICT into their lessons was higher (3.4375), indicating a modest level of efficacy. Additionally, a comparatively higher mean score (3.8229) for the availability of modern ICT tools in the school environment suggests that pupils have access to resources in terms of current technology. Students' engagement in the learning process (mean = 4.0938) and their comprehension of the course material (mean = 4.1458), both of which have higher mean scores, have been

positively benefited by the usage of ICT. Overall, students' perceptions of the incorporation of ICT have been positive (mean = 4.1771), suggesting that it has been advantageous for their educational experience. Furthermore, students think that ICT integration has enhanced their academic achievement (mean = 4.1250) and increased student involvement (mean = 4.1146).

Table No 5 C: Examining areas for improvement in the way ICT is integrated into the teaching and learning process.

17	The use of ICT tools enhances the quality of teaching and learning	4.0834	.52540
18	Teachers have access to sufficient ICT resources and training to effectively integrate technology into their	2.8031	.91386
19	Students have access to the necessary ICT tools and internet connectivity for their learning needs	2.1458	.88233
20	The department provides adequate technical support for ICT-related issues	2.7813	1.17162
21	Teachers are confident in their ability to use ICT effectively in their teaching	3.8854	.63028
22	The integration of ICT has improved students' engagement in the learning process	4.1042	.58901
23	ICT tools are regularly updated to meet the evolving needs of teaching and learning	3.6354	1.05750
24	The department encourages innovative uses of ICT in the curriculum	3.5000	.98408

The mean and standard deviation values for a collection of statements that look into the area for development in the way ICT (information and communication technology) is integrated into the teaching and learning process are shown in Table 5C.
A reasonably high mean score (4.0833) indicates that the employment of ICT tools is thought to raise the bar for instruction and learning, according to the mean values. Still, there are certain things that could be done better.

The lower mean score (2.8021) for teachers' access to adequate ICT resources and training for successfully integrating technology into their instruction indicates a need for further support in this area. In a similar vein, students have comparatively less access to the ICT resources and internet connectivity they require for their educational needs.
mean score of 2.1458, suggesting a possible deficiency in the provision of sufficient resources. Additionally, the mean score for providing sufficient technical help for ICT-related difficulties is lower (2.7813), indicating a need for development in this area. Nonetheless, the mean score of teachers' confidence in their ability to use ICT in the classroom effectively is greater (3.8854), suggesting a moderate level of confidence.

Higher mean scores (4.1042) suggest that students' perceptions of their increased engagement in the learning process are a result of the ICT integration. A moderate mean score (3.6354) indicates that there is still space for development in terms of routinely updating ICT tools to meet the changing needs of teaching and learning.

Finally, the department's moderate mean score (3.5000) for encouraging creative uses of ICT in the curriculum points to possible areas for more assistance and development of creative activities.

5. Conclusion

Information and communication technology is an important field role in teaching and learning. It is a field not limited to the industry and communication only rather it has spread its Importance to every field in the modern world. Similarly, teaching is no more limited to the white board teaching only. Teachers use variety of the methods to impart learning to the students. This results in not only catching students' attention effectively but also learning has been lot made easier through different application and online tools and virtual platforms. Learning and knowledge has gone beyond the narrow confines of classrooms. Looking into the importance of ICT this study was undertaken in order to find out the teachers' perception of the use of ICT in teaching learning process. A sample of 96 male and female teachers was calculated through Raosoft online calculator. The data was analyzed through inferential and descriptive statistics, usingChi-square T-Test, Enova and frequencies, percentage, means and standard deviation respectively. However, the teachers showed some concerns over the use of ICT. There were some issues like the lack of ICT labs, connectivity, teachers' confidence and short duration to finish the courses in.

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