

Integration of e-learning technologies for interactive teaching and learning process: an empirical study on higher education institutes of Pakistan

Integration of
e-learning
technologies

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Abstract

Purpose – The use of information and communication technologies (ICTs) has become a major driving force in transforming education worldwide. Similarly, in the last ten years, the usage of ICTs and e-learning in Pakistan has increased. Whereas the latest educational policy of the Government of Pakistan has focused on using ICTs and e-learning in schools and universities. The national professional standards for teachers have also suggested teachers to integrate ICTs in their classrooms and develop e-learning platforms for teaching and learning processes. However, in this study the effectiveness of information and communication and e-learning technologies integration in teaching and learning has been assessed. The context selected for this research study is a public university of Sindh, Pakistan. The research gap, which has been founded through the extensive literature review, indicated that most of the students are not able to utilize ICTs effectively. The first objective of this study is to enable students to gain wider range of knowledge and access Internet for developing a global outlook. Moreover, the second objective of this study is to develop students' capabilities of processing information more effectively and efficiently for teaching and learning.

Design/methodology/approach – By nature, this study is quantitative survey-based research study. For this purpose, data has been collected from students and teachers of English, Computer Science and Business Administration departments of targeted university, survey questionnaires have been adopted as a data collection tool. Whereas the random sampling technique is used for the collection of data by using Morgan table of sample size. Additionally, data has been collected from 100 participants, 80 of them were students and 20 were teachers, and data has been analyzed by using SPSS 22.0 software.

Findings – The findings of this study have indicated the student's level of interest toward the integration of ICTs and e-learning in science and social science courses. Similarly, the findings specify that through ICT and e-learning materials, students can learn more effectively, which can also facilitate teachers for their teaching process in this modern era of technology. Whereas the issue that has been specified through the findings is that the teachers are not encouraged by the management of the university to implement the ICT in their teaching and learning due to their concerns on the limited resources and lack of competencies.

Practical implications – For the practical implication, the findings of this study will facilitate the teachers and learners for integrating the ICTs and e-learning in their course curriculums and interactive teaching practices as per modern era of technology. Also, this study will help the provincial leader and policymakers by addressing the teachers' concern to encourage the integration of ICT tools and develop capabilities for interactive classrooms for effective teaching and learning.



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Originality/value – This is the first study of its nature that has been conducted in the Pakistani public university in rural setting, and the finding of this study will facilitate and help the institutional and government stakeholders to where and how they can effectively integrate ICTs and e-learning in classrooms for interactive teaching and learning processes in the rural Sindh.

Keywords E-Learning, Interactive learning, Rural education, Educational policy

Paper type Research paper

1. Introduction

ICTs refer to technologies and communication of information by electronic equipment especially computer for creating, storing, analyzing and sending information. In our society, teaching is considered as a most complicated profession where ICT takes deep roots to attain a great source of information. ICT ensures a long-lasting effect on learning through text, graphics, animation or audio and videos. In addition, it develops positive groups and social interaction and enhances interpersonal and intrapersonal skills of learners. Information communication technology (ICT) pertains to the use of computer-based communication that involves classroom and e-learning instructional methods. Moreover, ICT can fulfill the aim by expanding the rise of quality, accessibility and cost-efficiency of the delivery of instruction to students, it gives learners benefits to face the challenges of globalization ([John, 2015](#)). Furthermore, ICT plays a substantial role to change enormous aspects of human endeavor's and it let great influences on numerous fields just like medicine, tourism, law, banking, business and engineering. Therefore, integration is not based on a single step; it pursues constant steps that complete support teaching-learning information resources.

Through ICT, learners can easily access online course material at any time at any place. Now, by utilizing ICT learning is no more based upon printed materials. Huge resources are available on the Internet through which knowledge can be progressed with huge variety of presentation topics, videos, audios, graphs and so forth. Furthermore, ICT can help to transform from the teacher-centered environment into a learner-centered setting ([Sánchez and Alemán, 2011](#)). Subsequently, ICT classroom learners are actively engaged, teachers make them authorized to make decisions, plans and solve their problems ([Fu, 2013](#)). Therefore, ICT provides great assistance to instructors and learners to gain maximum possible knowledge in the educational area. Likewise, it is revealed that ICT left profound impacts on the education system, and it is observed that ICT enables great learning potential and interactive learning environment in countries that integrated ICT ([Hennessy et al., 2010](#)). Some researchers stated that ICT expands the significance of education, and it prospers effective pedagogies to provide the effective understanding and enhance communication in learning. Including [Bingimlas \(2009\)](#), many other researchers acknowledged that ICT expands learner's knowledge. Thus, ICT is computer-based and should integrate into education, which can greatly impact student accomplishment.

1.1 Background of research

In early 1990, computer technology was initiated in the classroom. Expectations regarding ICT become high that it would change the shape of education system. It was estimated that ICT ultimately replaced textbooks through e-learning. Though the use of ICT is greatly supported by educational policymakers ([Wong and Li, 2008](#)). Integration of ICT is observed to be more important to expand the effectiveness of teaching and learning methods. As technology unfolds an important role in our daily lives, it can also perform a significant role in the process of education ([Hew and Brush, 2007](#)). Adapting great levels of ICT in various schools, it has been observed that it does not bring any change in practicing teaching and learning ([Coll et al., 2009](#)). Many researchers recommended that teachers should be given appropriate training for the effective integration of technology and e-learning in making

teaching and learning method more refined. If they are aware of proper utilization of ICT certainly, they will face problems in planning teaching activities and projects where ICT needs are greatly observed.

1.2 Problem statement

This study aimed to determine integration of ICT and e-learning at higher educational institutions in Pakistan. It is known that all learners are not effectively implementing ICTs in their learning; the reason is very considerable investments to the ICT integration in the learning. ICT indicators in education aim to enhance educational outcomes and improve the quality effectiveness of learners (Butt *et al.*, 2020; Wong and Li, 2008). Educators are not efficiently using computers as they should suffer with the emergence of rapidly changing technologies, it should keep in mind that learners must have to know and learn new skills and practice new knowledge (Wells and Lewis, 2006).

In addition to it, many countries are investing billions of dollars to equip the schools with modern computers and telecommunication networks. Furthermore, some studies show that not all teachers are fully aware of the numerous benefits of ICT and how to take advantage of them in the classroom; some teachers may have positive attitudes toward integrating ICT in the classroom. (Hew and Brush, 2007). Further, ICT is speculated as one of the great economic advancement pillars to achieve the nationwide competitive goal. It can broaden the betterment in human life through learning and progressing education. Therefore, the purpose of this study is to observe the effectiveness of ICT in teaching and learning and its impacts on students' learning, gaining knowledge and prepare students to achieve greater competency on their subject matter.

Moreover, 7th standard recommended to teacher educators to prepare teachers with mastery to use various educational technology devices of hardware and software can enhance teaching and learning process (Butt *et al.*, 2020). The education system of Pakistan grabbed from academic consequences on a huge scale. Most often all teachers and pupils of Pakistan are stimulated with computers and the Internet installations for their personal use, but the integration of ICT in the classroom seems slow. In progressive nations, it proceeded hastily. However, in developing nations such as Pakistan, use of ICT is its primary phase due to limited resources. Moreover, in developed countries, teachers expanded their new proficiency while in developing regions learners additionally advanced their skills than their instructors by utilizing smart phones, iPad and laptops. It is observed that main deterioration in acquiring technology comes not from learners but mostly from teachers. Not only instructors are reluctant to approve the technology but further aspects such as the absence of software and hardware, teacher's belief toward technology also create a challenge.

1.3 Scope of the study

ICT is associated with communication technology. In the current life, technology gets advancement day by day and the Internet is supposed to play a most vital role. It contributes and provides incredible benefits in the field of education. Teaching is considered as an art, and that art requires understanding various developmental features of students at their different stages. ICT enables to provide great advantages for the teacher to achieve quick information on the learner's work and performance. Modern technologies improve the quality of teaching and learning. It has become a valuable part of the daily routine work. Technologies expand the setting of learning and enhance instruction productivity. Through computer technology notes, books, publications, magazines can be easily digitalized. Thus, it provides great favors to teachers and learners in extending knowledge. ICT stimulates skill construction and fascinating lifelong learning. Through the Internet, students can discover

great information relevant to their subjects that brings forth the performance of the student on the basis of teacher's expectations.

1.4 The context of study

The context of the study is related to a public university of Sindh (Pakistan) where the study is conducted. Pakistan was established on the map of the world as an independent state in August 1947. There are four major provinces in Pakistan: Punjab, Sindh, Gilgit Balochistan and Khyber Pakhtunkhwa. Each has their own language, culture and customs. Moreover, Pakistan is situated in the south Asia and is the sixth largest country and second largest country in relation to population. Whereas, in terms of educational policy of Pakistan, number of government policy documents have sought to address educational needs over time. The latest education policy document highlights these shortcomings of previous policies and draws attention to the unacceptable educational conditions in the country. Notably, the policy argues that the existing education system has failed to address the need of large groups of children and adults. For example, there is a large out-of-school population among children; this is made up of children who never go to school, those who start school but drop out and those who continue in school but are ill-equipped for higher education. In the era of science and technology, education is getting more important place in the society. As, it is only way to excel in the global context. It is possible by the effective use of information and innovative use of technology. Use of ICT can enhance teacher training and build their content knowledge and also make them able to play a more powerful role in the classroom. The reasons for using ICT in classrooms is to better prepare the new generation for a workplace that depends mainly on ICT. It is also a powerful tool to enhance access by transferring new knowledge to teachers and children in remote areas.

1.5 Research objectives

The goal of ICT integration in the teaching and learning process reveals the vision and mission of the Government. The aims and objectives of this research are:

- (1) To analyze the level of ICT and e-learning integration of interactivity in teaching and learning process in a public university of Pakistan
- (2) To specify the students' and teachers' capabilities for enhancing the teaching and learning process by using ICTs and e-learning

1.6 Research questions

To achieve the research objectives, these are the research questions:

- (1) To what extent integration of ICT and e-learning brings interactivity in teaching and learning process in a public university of Pakistan?
- (2) What are the students' and teachers' capabilities for enhancing the teaching and learning process by using ICTs and e-learning?

2. Literature review

Learning pedagogies have been changed with ICT integration. Teacher-centered changed into learner-centered. Initially, traditional classes were based on the lecture method where the student remained paused and teacher played a part to transfer their knowledge and learner only depended to get information from the teacher. Moreover, the teacher has to design a lesson, set objectives of the lesson and give justification to the students. However, it shifted from teacher- to learner-centered. It also shifted the role of learner and teacher. Students became the most active participants of the lesson (Ozerol, 2009). Ozrel (2009) stated

that an independent class permits students to learn effectively and individually. Through call class learners become active to take the accountability of their learning. However, through the integrity of technology learners do not depend on their teacher. Technology initiates the interest of learner to learn in their own way, feel more liberty, and learner attains the experience to learn the language.

Further, learning through technology, students not only attain information, but it also plays a valuable role in teaching and learning. They appropriately utilize and transfer that information. It permits the learner to know their own interests and capabilities power. Technology provides updates on evidence. They can easily communicate with the world. (Farahani *et al.*, 2015) ICT expands own pace of understanding. It enables to make the learner competitive, positively stimulates mind abilities; it reinforces their proficiency; it enriches their thinking power.

2.1 Technologies enhance the capabilities of learning

ICT brings enormous modifications in the area of learning. Technology positively affects the learning process. It makes learner be more engaged, ICT gives the learner meaningful experiences. Nowadays, technology is known as a powerful tool, and it has a great contribution to learning. Moreover, a traditional approach is focused on content only. For centuries, course content was only remaining around textbooks. Teachers used to transfer their knowledge through the lecture method. Currently, ICT provides enormous learning experiences for students. ICT not only performs an important role in making the learning process more comprehensive, but it also blazes students' educational performances. Nowadays, curriculum focuses on aptitude and performance of students. ICT is a constructivist procedure, approach for realistic learning and focuses on a learner-centered process rather than teacher-centered. Where the teacher lets students stimulate the mind by using ICT techniques to make them critical thinkers, building ideas, displaying their extent of knowledge, accessing themselves in the suitable collaborative system of learning. Multimedia functions as a powerful tool that improves thinking power through which learners express and share knowledge. This software provides great assistance to the student to understand the concepts by doing it practically. It helps the student to acquire an independent approach toward problem-solving. Computer facilitates students to enhance their power of thinking (McMahon, 2009).

Through ICT, students can easily engage and interact with teachers and each other as well. It provides a different perspective on dealing with the issue and provides applicable ways to solve the problem (Ziphorah, 2014). ICT also assist in collaborative learning (Bindu, 2016), teaching-learning process by increasing interaction and reception of knowledge. ICT introduced a new scenario, which favors individual learning as well for collaborative learning. The teacher can perform a key role in the integration of ICT. It is important for the current teachers that they should not only be stuck to the knowledge content, but they also know how to impart knowledge in the mind of learners efficiently by integrating ICT. The teacher must be well known about the usefulness of technology and should confidently know how to manage it. Furthermore, research studies suggested that the majority of teachers do not utilize and take benefits of ICT properly though even they possess favorable attitudes. ICT contributes a massive role in learning innovation, practices and leaves positive approach for pedagogical strategies.

2.2 Information and communication technology and e-learning integration in interactive classroom

The major important aspects that have been indicated by integration of ICT and e-learning in the classroom by Ahmadi and Reza (2018) are that ICT and e-learning enhance the depth in the content area, ICT makes the learner to enhance academic engagement time, With great

content knowledge, learners can go beyond for analysis of the information and comprehension, ICT skills should require isolation for learning, students learn by using different computer skills. Similarly, [Billings and Mathison \(2012\)](#) stated that by two ways of technology, learners can enhance their possibility of achievement. Firstly, with the engagement of material, they perform adequate function. Secondly, it develops excitement in learner to take part in the class activities, and it is one of suitable advantages to make learning more desirable for pupils. If they are having the fun-based material, it will definitely create better insights. Moreover, the learner feels delighted when the lesson is planned on the basis of amusement. Before integrating ICT, teacher must know the effective use of ICT, and they can teach and transmit the appropriate use of skills to learners. It is stated that ICT use enhances the capability of information for the learner. They can be good decision-makers, creative analyzers, problem-solvers ([Moore, 2015](#)).

2.3 ICT and e-learning favor student-centered approach

Learners are engaged in productive learning through computers ([Sánchez and Alemán, 2011](#)); they enhance a new area of knowledge through creating, accessing, selecting, organizing and understanding of data. Through ICT and e-learning, students can make them capable of using data from a variety of sources and critically evaluate the quality of learning materials. A creative learning environment technology helps students to develop new understanding in the area of learning ([Chai et al., 2010](#)). ICT provides great problem findings for learning analysis. Learners can easily access the text by using computers, laptop or iPod. The e-book can be originated on reading the application. This offers to read the content aloud. Learner can easily access the relevant vocabulary and building activities. Therefore, technology provides a variety of applications, which provide innovative ideas to reach the goal of learning.

2.4 ICT and e-learning improve cooperative learning in a distance learning setting

According to [Fu \(2013\)](#), through technology, learners can easily share, connect, transfer information anywhere anytime. Students around the world can be connected at a similar time for discussion of the topic or through observing the several capacities of learners, they analyze, explore and expand new information and notion. Through ICT they can express themselves by developing confidence and get a reflection on their learning.

2.5 Fascinate learners by motivation

On learner's achievements, studies held out in the United Kingdom by impact disclosed that ICTs left massive positive impacts on behavior, communication and motivation. When teachers utilize ICT in teaching and learning, it brings a great shift in student's attitude with great interest in learning. In addition to this view of e-learning, [Pedersen et al. \(2006\)](#) also highlighted the great significance of ICT in motivation, engagement and mastery of student skills. Furthermore, ICT boosts confidence and motivation and makes learning more delightful, fascinating and fun-based thorough which students enhance their capability of learning.

2.6 Instructors' belief on the integration of ICT in interactive teaching and learning

Furthermore, [Punie et al. \(2006\)](#) state that in the current scenario, ICT is used in the classroom for interactive pedagogical practice. They further state, "Many teachers achieved pedagogical knowledge (through adequate access to ICT and via training and discussion of pedagogical concept) and teachers have promoted the use of ICT in the teaching-learning process". Similarly, a favorable result asserted by [Ngavana et al. \(2018\)](#) was that majority of

teachers overwhelmed the level of confidence in exercising the ICT in the classroom. ICT supports the teachers to try new methods, reasoning, evaluating on practice and fascinating with new equipment and advancement in the science of learning. Therefore, it is observed that ICT training helps to support teachers to prepare and plan for the office and for standard in education. [Ngavana et al. \(2018\)](#) also favor that it put an optimistic impact on teachers' divine supervision, attitude and behavior.

2.7 Conceptual and theoretical framework for ICT integration in teaching and learning process

To enhance the skills of ICTs and utilizing ICTs in teaching and learning process is necessary for teachers and students, in order to make the teaching and learning more effective. In the study, the theory of self-efficacy has been integrated and supported the developed conceptual framework that shows the motivation toward the integration of e-learning technologies while teaching and learning process among teachers ([Dikko, 2016](#)).

2.8 Proposed research framework

The proposed framework for ICTs integration in teaching and learning process is shown in [Figure 1](#). It is composed of eight elements. It highlights that how ICTs integration makes teaching and learning effective.

2.8.1 Justification of the proposed framework.

(1) Pedagogical skills

It is necessary to acquire the skills of pedagogy by using ICT for the better teaching and learning process. The ICTs and pedagogical skills by using ICTs tools are mainly different. These pedagogical and technological content knowledge models help in developing appropriate content by combining the sources of knowledge, pedagogy and technology. To make lesson interactive, the constructivist learning theory should be kept in mind. According to [Varghese \(2015\)](#), constructivism theory makes the learning active as learners build their own knowledge on the bases of their prior experiences rather than passive transmission of knowledge. The model of constructivist calls as learner-centered because in this, students explore and discover their learning on their own. ICTs integration shows the

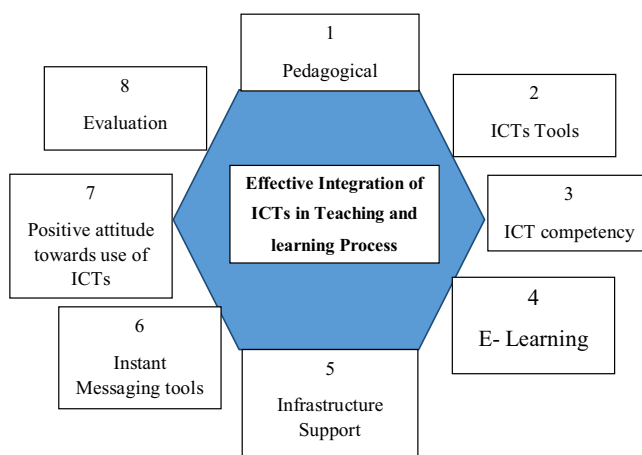


Figure 1.
Framework for ICT
integration in teaching
and learning process

use of the tools of ICTs just like the utilization of visual aids. Some researchers pointed out that it is important build techno-pedagogically skilled teachers because it gives the understanding of teaching with technology to teachers.

(2) The ability to use ICT and e-learning tools

The use of ICTs tools is playing an important role in the process of teaching and learning. The tools of ICTs develop the interaction and collaborative culture also make the learning active. The ICTs tools build the abstract concepts in the real-world experiences by modeling, simulation and analysis of concepts (Jung, 2006). Some theories such as the constructivism, sociocultural, multiple intelligence and problem-based learning play a vital role in managing the learner-centered classroom. ICTs give them specific tools to use the aforementioned theories in order to make the learning environment engaging and creative. Furthermore, teachers must be motivated intrinsically to implement the tools of ICTs in the teaching and learning process.

(3) Professional competencies development:

Teacher's professional competences about the integration of technology and pedagogy can be made possible by these four stages: emerging, applying, infusing and transforming. The emerging stage is that teachers must begin to understand and be aware about the potential and use of ICTs. It helps the teachers to build their competencies in the MS office and use of Internet and email. In the applying step, teachers must learn how to use ICT in the process of teaching and learning. The infusing stage shows that the different tools of ICTs are effectively and appropriately selected for the process of teaching and learning, and the transforming stage implies the innovative ways of teaching and learning with the specific tools and change the classroom environment from teacher-centered to students-centered.

(4) Interactive e-learning

E-learning is in contrast to the traditional teaching. The students again at different places can take help related to lesson through e-learning. In addition, through interactive e-learning websites and tools, effective and positive learning environment can be created (Goh and Sigala, 2020). According to Meyer, critical thinking is the important skill that can be enhanced by online learning environment. In a way student can link and reflect on their learning. In the nutshell, e-learning is to use the technology to enhance the accessibility and effectiveness of the learning (Shinde and Shaikh, 2020).

(5) Instant messaging tools

The teachers can make their students learning effective by collaborating with them or involving them in learning groups. If teachers want to give instruction about specific assignment, then they can email that to students. It helps the students to obtain the necessary information through that email (Saner, 2020).

(6) Positive attitude toward the use of ICTs

According to Epstein and Sanders (2006), family and school partnerships are important to give students support in learning activities at home. As parents provide the facility of ICT to students at home, it helps the students in the development of their learning. Furthermore, the findings from the observations of teachers are that teachers' attitudes toward the ICTs use have been poor, and mostly teachers do not want to use it in their teaching (Warwick and Kershner, 2008), which highlights that for changing the attitude of teachers toward the use of ICTs. It is important to know the difficulties that teachers face in the usage and how they can

deal with it. In the mindsets of teachers, a paradigm shift is important as well as inspiration of possessing the skills and knowledge of information technology. Teachers must have the positive attitude toward the use of IT.

(7) Support of infrastructure and evaluation

The infrastructure facilities such as computer labs play important role in the ICTs integration. And the other thing is that there must be teachers who use ICTs appropriately. Thus, students can get benefit from the resources of technology. The evaluation helps in the improvement of the programmed and students' learning. Evaluations are of two types: summative and formative. Similarly, the design of lesson helps the students to do the activities with the help of Internet by online tutorials.

3. Research methodology and material

This section describes procedures that are followed in conducting this study. It consists of the descriptions of the research design, population, location of the study sampling and also the data collection and analysis techniques.

3.1 Research design

This research is followed by a quantitative methodology by following descriptive (survey) research design describing the survey research as a study on different number of populations, with the help of selected population. By using quantitative approach, researchers are able to know the reliability of the tool in the context of Pakistan. According to (Creswell), quantitative research is known as the process of collecting, analyzing, interpreting and writing the results of a study.

3.2 Population and sampling

This study was carried out in the Sindh, Pakistan. Participants were selected randomly, because it was easy for researchers to access the selected university and collect the required data about their study. For this study, the targeted population was the students and teachers of a public university of Sindh. The teachers are real implementers of the designed curriculum of universities. Therefore, they play vital role in the process of teaching and learning. Similarly, students learn from that environment and can give important feedback about the teaching and learning process. The total participants for this research were 80 students and 20 teachers from a public university of Sindh. The questionnaires were randomly given to all respondents. So, respondents that take part in the study were from the business, English and computer science departments.

3.3 Research instrument

Two survey questionnaires are used for data collection. One with total 22 items and other consists of 10 items. In that all participants were asked to read the given statements that were provided in the questionnaire. They were instructed to choose the answers on the bases of Likert scale. That ranged from the 5 = Strongly Disagree, 4 = Disagree, 3 = Neutral, 2 = Agree and 1 = Strongly Agree. Both the questionnaires consisted of two sections. A section is about the demographic information of participants. That consists of gender, age, department and teaching experiences. Furthermore, the other part in the questionnaire consists of the students' and teachers' perceptions about the effective integration of ICTs in teaching and learning process.

3.4 Data collection procedure

The researchers modified the questionnaires before giving it to targeted population. By following Morgan’s rules for sample selection, the total of 80 questionnaires being distributed to all respondents and 20 questionnaires were filled by teachers. A total of 30 min was given to the respondents in order to fill the questionnaires and then return back that to researchers for the analysis of data. That helped the researchers with the findings of the study.

3.5 Data analysis process

The data that was collected from the participants were analyzed by using (SPSS) statistical package for social science version 22.0. In this analysis, both the descriptive and inferential analyses were included. In addition to this, the researcher used the descriptive analysis to know the frequency and percentage of demographic information of the population. Furthermore, it used to show the mean, SD, percentage and frequency to know the effectiveness of ICTs integration in the teaching and learning process at a public university of Pakistan.

4. Results and findings

This section of this research article highlights the data presentation, analysis and interoperation. The aim of data analysis is to answer the questions of this research study, which are the following:

- (1) To what extent integration of ICT and e-learning brings interactivity in teaching and learning process in a public university of Pakistan?
- (2) What are the students’ and teachers’ capabilities for enhancing the teaching and learning process by using ICTs and e-learning?

The first part of the analysis of the data deals with the demographic information of participants. That covers the age, gender, department and experience of respondents. Similarly, the other part shows that how much students and teachers are giving importance to integration of ICTs in their teaching and learning process at a public university of Sindh. The data is presented in the form of tabular description. Following are the results of data analysis through the use of SPSS with their interpretation.

4.1 Questionnaire response rate

The filled questionnaire rate is same as the sample selected for this study. The questionnaires were administered to a sample of total 100 participants. Out of that 80 were students and 20 teachers. All participants filled and returned the questionnaire to the researchers. Table 1 shows the summary of the filled questionnaire rate.

4.1.1 Reliability of survey questionnaire for perception of students. The reliability of questionnaire 1 about the perception of students about the effective integration of ICTs is about 0.7. As a matter of fact, the alpha coefficient 0.7 is considered to be appropriate. Similarly, the reliability of questionnaire 2 about the perception of teacher about the effective

Table 1.
Questionnaire
response rate

Respondents	Sample	Filled and returned	%
Students	80	80	80%
Teachers	20	20	20%
Total	100	100	100%

integration of ICTs is about 0.5. The alpha coefficient 0.7 is considered to be significant. But it shows less significance.

4.1.2 Response on the integration of ICT and e-learning for interactive teaching and learning. According to the findings of first research question as depicted from Table 2, it has specified that the integration of ICT and e-learning facilitates the interactive teaching and learning process with the highest mean of 2.5. Whereas some respondents specified that ICT is not much helpful to bring creativity and innovative ideas with mean score of 1.53, which indicate that they are not fully satisfied with technological assistance and could not rely on ICTs to bring more creativity. However, it has been asserted through the smaller mean of 1.88, students perceived that ICTs play an important role to communicate the ideas effectively. Moreover, throughout outcomes of study, it is observed, the majority of students believed that ICT and e-learning played significant role in an enhancement of knowledge with mean of 2.4, it provides great assistance to make effective learning with the approximate mean of 2.0; students considered that with sources of technology they comprehend their ambiguous concepts; and it is useful to develop confidence level with 2.03 mean.

4.1.3 Students' and teachers' capabilities for enhancing the teaching and learning process by using ICTs and e-learning. Finding of research question 2, as highlighted in Table 3, shows that the respondents assumed that the use of ICTs and e-learning does not enhance the capabilities of students and teachers with an approximate highest mean of 4.15. However, some respondents indicated that the integration of ICTs is an easier way of teaching with the lowest mean of 1.4. In addition, it is observed through collecting data that teachers favored the use of ICTs and they felt that ICTs play an effective role in teaching and learning with a similar mean of 1.6. Moreover, it has been observed that respondents feel that they don't have enough time for using ICTs and e-learning resources but still they feel that they learn great new things through the help of ICT and feel comfortable in use of technologies with the same mean of 2.0. Furthermore, it has been estimated with a mean of 2.90 that teachers felt a lack of support from management for effective ICTs integration in the campus. Further, teachers believed that ICTs enhance the quality of teaching and are helpful for preparing teaching resources materials with the exact same mean of 1.85. Subsequently, they speculated that ICTs focus to fulfill the student's demands of learning with a mean of 2.5.

5. Conclusion

According to the study of the effectiveness of ICT and e-learning integration in teaching and learning, there is a lack of support and management, which did not encourage the integration of ICT in teaching and learning. This study suggested that the teachers are satisfied with the effectiveness of using ICT in their own learning perspective but feel slightly reluctant to

Items	N	Mean	SD
ICT allows students to be more creative and imaginative	80	1.5375	0.57244
The use of ICT helps students to find related knowledge and information for learning	80	1.7625	0.83049
The use of ICT encourages students to communicate more with their classmates	80	2.2000	0.95996
The use of ICT increases students' confidence to participate actively in the class	80	2.0375	1.03659
Through the use of ICT students learn more effectively	80	2.0875	1.04571
The use of ICT helps to broaden students' knowledge paradigm	80	2.4250	1.01601
ICT helps to improve students' ability specifically in reading and writing	80	2.2500	1.10808
The students are well behaved and under control with the use of ICT	80	2.5375	1.06668
The use of ICT enables students to express their ideas and thoughts better	80	1.8875	0.94123
	80	1.8875	1.06728

Table 2.
Results of first research
question

Table 3.
Result of second
research question

Items	N	Mean	SD
Learning new computer skills makes students confident	20	1.5000	0.51299
ICT helps teacher to teach in easier way	20	1.4500	0.68633
ICT offers great opportunities to make teaching effective	20	1.6500	0.74516
ICT-supported teaching makes learning more effective	20	1.6500	0.87509
ICT helps teachers to improve teaching with more updated materials	20	1.5500	1.05006
The use of ICT enhances the quality of teaching	20	1.8500	0.74516
ICT helps to prepare teaching resources and materials	20	1.8500	0.81273
The use of ICT enables the students to be more active and engaging in the lesson	20	1.9000	1.20961
The use of ICT provides more time to teachers to focus on students' needs	20	2.3000	0.86450
Teacher's methods can be effective without the use of ICT	20	2.5500	1.19097
The use of ICT in teaching is a waste of time	20	4.1500	0.74516
Students learn best without the help of ICT	20	3.6000	0.82078
The classroom management is out of control if ICT is used in teaching	20	3.8000	0.69585
Students pay less attention when ICT is used in teaching	20	3.4500	1.14593
Students makes no effort for their lesson if ICT is used in teaching	20	3.1500	0.81273
Little access to ICT prevents teachers	20	2.7500	0.96655
To use ICT in teaching and learning process	20	2.2000	0.89443
Lack of support from the school	20	2.9000	0.96791
Top management discourages teachers to use ICT	20	2.5000	1.05131
Teaching time is not enough for teachers to use the ICT for teaching and learning purposes	20	2.2000	0.95145
	20	2.6000	0.88258
	20	2.3000	0.92338

implement ICT in a classroom atmosphere. This study also finds out that the majority of teachers supposed that it is not that much productive in the classroom and they considered that it is the toughest way to engage students by implementing ICTs in the classroom. Reason could be lack of providing trainings on effectiveness of ICT from management and no arrangement for ICT implementation in classroom. In spite of this, teachers and students favor the statement that it is greatly helpful for student learning and mainly focused on student needs; it develops enthusiasm in learning and students share their understandings, beliefs effectively. Through this study, teachers and students seemed to be satisfied that ICT plays significant roles to develop proficiency of knowledge.

The aim of this study was to find out that to what extent ICTs and e-learning are integrated in the teaching and learning in a public university of Sindh Pakistan. This study also identified the student's capabilities of processing information more effectively for teaching and learning by using ICTs. Firstly, the findings suggest that questionnaires are reliable in the context of Pakistan. In conclusion, to make effective implementation of ICTs, it is to make sure the availability of ICTs and either teachers or students are able to use it effectively. However, the availability of ICTs facilities and support from management were not found to be statistically significant. In addition to this, students and teachers must be provided with the equipment and made literate about the ICTs and e-learning knowledge and skills. It helps the teachers to improve the teaching methods to promote the effective learning also to meet the demands of the 21st teaching and learning skills.

In the light of more concerns toward the spread of COVID-19, many institutions have shut down in regard to face-to-face classes globally. Against the backdrop of it some policy initiatives are being launched by the governments across the world to continue the teaching and learning activities. On the large scale, the utilization of technology in support of remote learning, distance education and online learning is emerging fast. However, due to some limitations, current situation demands the actions so that the education of the students is not affected in any way. For example, China imitated the suspension of classes without stopping

the learning. This is one of the many policies that China put in place so the learning of students affected least during national lockdowns. Similarly, this follows in provinces of Pakistan.

According to the UNESCO Report by the 2019 end, COVID 19 started rapidly spreading throughout the world. Several countries started initiating the online or home-based learning. With the rapid evolution of ICT, in the wake of COVID-19, the integration of technology needs special attention in higher education. Moreover, COVID-19 pandemic and social distancing requirement presented the challenges on all stakeholders to work online by keeping in view the time and resources during current situation. It is known that adopting online learning environment is not just a technical problem. But it is also a pedagogical and instructional challenge. In essence, ICT is the potent force to transform the educational landscape in the overall world. However, to transform the education from traditional physical classrooms in response to COVID-19 requires thought, coordination and best decisions. There is an obvious impact of technology in the online lives of many people. The COVID-19 has provided the opportunity to adopt online learning in education systems as a necessity throughout the world. Cumulatively, this research study may be useful for effective integration of ICTs in teaching and learning process in higher education. Similarly, findings from this study are essential for policymakers, who are seeking to progress from use of traditional approaches to innovative and interactive approaches in teaching and learning by the use of ICTs. So, the pupil can get the higher academic achievement and make their learning better.

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