



## THE USE OF INFORMATION COMMUNICATION TECHNOLOGY IN THE CLASSROOM: OPPORTUNITIES AND CHALLENGES FOR UNIVERSITY TEACHERS

SAMIA ZAHEER<sup>1</sup>, NAVID JAMIL MALIK<sup>2</sup>, NAMRA MUNIR<sup>3</sup>

### ABSTRACT

Modern technological tools revolutionized teaching and learning. The study's goals were to 1) find out the role of opportunities in use of ICT within classroom, 2) to explore the challenges for use of ICT in classroom at university level. This study used a descriptive research method, and the population includes all the university teachers in the universities in the Lahore division. The study sample consisted of 250 teachers. The questionnaire was pilot tested for reliability and validity. The study revealed that university-based professors use digital libraries to expand their expertise. The quantity of PCs in computer labs is likewise lacking. Teachers are reluctant to employ advanced ICT devices. The study found that while teachers have positive opportunities to use ICT resources and technologies in universities, teachers (34%) report that they are facing many challenges in using ICTs at the university level. The research concluded that teachers' usage of ICT tools could increase their motivation and productivity. The study may recommend that universities provide enough teacher training facilities, ICT-related courses, and specialists to improve their technical expertise based on modern information and communication technologies.

**Keywords:** ICT, Possibilities, Hurdles

**JEL Codes:** L86

### I. INTRODUCTION

When modern technological tools were introduced, they completely changed how people taught and learned. According to their findings, we can learn about the applications of modern information and communication technology (ICT) tools in higher education institutions from the research conducted by Voelzke et al., (2019). ICT (information and communications technology) (ICT) devices play a significant role in the modern workplace. Immediately upon its introduction, information and communications technology (ICT) changed the way people interacted with one another and their surroundings and how they performed their jobs in organizations. It is investigated in several research studies whether or not these advanced information and communication technology (ICT) gadgets are effective in the classroom, as well as whether or not teachers believe they are effective during the teaching and learning process (Hevko, 2019; Celebi, 2019; Islahi & Nasrin, 2019). In information gathering and processing, computer-aided technologies (ICTs) are electronic tools used to assist in the process. Besides data storage, they also include data distribution and presentation of information. To accomplish the goal mentioned above, various related tools, such as Android applications, computer machines, advanced software versions, the most up-to-date hardware devices, satellite technologies, and Wi-Fi zones, among others, are used (Roy, 2015). Modern information and communication technology (ICT) devices attached to classroom presentations result in significant improvements, but it also raises concerns about using ICT devices in educational environments. In such circumstances, university professors are constantly looking for ways to make their classrooms more creative and inviting for students and faculty members. University instructors are enthusiastic about technological advances. The use of information and communications technology in the classroom was frequently beneficial (ICT). These ICT tools were discovered to be among the most commonly used in this study, including information retrieval sources, multimedia platforms, data processing word devices, and

<sup>1</sup> Lecturer, Fatima Jinnah Women University, Rawalpindi

<sup>2</sup> Professor; Department of Education, University of Sialkot, Sialkot

<sup>3</sup> Assistant Professor, Department of Education, University of Education, Lahore-Vehari Campus

data analysis Microsoft Excel spreadsheets (Granados & Jaramillo, 2019). Several factors must be considered in order to effectively use ICT as a motivational tool in university-level teaching (Mwendwa, 2017), including teachers' thinking about ICT use (Umar et al., 2014), teachers' technical knowledge and skills (Umar et al., 2014), teachers' professional and self-development (Hevko, 2019), teachers' training (Islahi & Nasrin, 2019), teachers' (Fu, 2013) For example, Frost, MacLeod, and Laronde (2017) describe the availability of technology, as well as updated software and hardware (Gilakjani et al., 2019), technical expertise and support (Gilakjani et al., 2019), among other factors (Taimur-ul-Hassan & Sajid, 2013). Following the consideration of the factors listed above, it has been determined that better use of advanced gadgets in classroom teaching and learning activities will be made.

Bhattacharjee and Deb (2016) investigated how instructors in higher educational institutions are perceived to be developing more skilled personalities due to the use of information and communications technology (ICT) devices, as discussed in their research work. In order to improve the learning process for students and achieve educational objectives, technology-enhanced learning (ICT) devices are being used more often. It is the opinion of educational professionals that the use of information and communications technology (ICT) for the professional development of educators aids in the retention of future teaching practices and the achievement of student learning progress in a challenging learning environment. It was discussed in the study conducted by Wahyudi et al., (2018) about teachers' proactive participation in the teaching-learning process through the implementation of digital machines in higher education. Teaching personnel is developing motivational skills by integrating information technology into the classroom and integrating cutting-edge applications into the curricula. Motivating students in both the classroom and the learning environment is critical in this situation. Teachers and students are using this generation of digital devices for various purposes because they are an essential part of the digital era for today's students (Frydrochov-Klimova & Poulova, 2014).

It is the purpose of this study to examine the advantages and disadvantages of integrating advanced information and communication technology (ICT) gadgets into teachers' instructional practices. The advanced skills and relevant knowledge of teachers, as a result, serve as motivating agents for the successful integration of these technological devices into pedagogical practices. In order to address this, several research studies (Olofsson et al., 2018; Voelzke et al., 2019) investigated the factors that were available and missing when using ICT devices in the teaching zone, as well as the factors that were required to make things possible or difficult for the proper attachment of these advanced ICT resources in the complex learning environment (Sipila, 2014). To assist teachers in becoming more knowledgeable, educational institutions in Pakistan provide advanced computer appliances and high-speed internet access. Moreover, these are used to assist teachers in achieving greater levels of professional and personal development in less time. Although progress has been made, incorporating ICT-based activities into classroom activities continues to be slow. It appears that teachers are the primary cause of the significant decline in the adoption of new technologies. Beyond teacher reluctance to adopt technology, other factors such as a lack of advanced hardware appliances, a lack of the most recent software, a lack of technological knowledge, a lack of confidence in one's abilities, inefficient time management, and a lack of teacher training opportunities all play an essential role in impeding the effective integration of technology into classrooms (Bingimlas, 2009). Teachers are utilizing information and communications technology (ICT) for various purposes other than academics (ICT). It is undeniable that technology is creating opportunities for improvement in the educational process while also altering teachers' perspectives on the use of technology in their classrooms. With the use of information and communication technology (ICT) tools, teachers' motivation, professional, technological knowledge, and skills are enhanced. However, when it comes to using information and communication technology (ICT) in higher education, there are both opportunities and difficulties. The purpose of this study is to investigate the relationship between the opportunities and obstacles that exist in the use of information and communications technology (ICT) resources and tools among university educators. This research has several objectives, the most important of which are as follows:

1. to find out the role of opportunities in use of ICT within classroom
2. to explore the challenges for use of ICT in classroom at university level

## II. REVIEW OF RELATED LITERATURE

Researchers have recently put forth their best efforts to integrate information and communications technology (ICT) into the education field. They discovered that recent advances in information and communication technology (ICT) have a creative effect on people's ability to seek knowledge. They asserted that recent media are excellent tools for presentation and that this shifts the entire environment toward student-centered learning. According to a review by Toro and Joshi (2012), advances in information and communication technology (ICT) bring about fundamental changes in education. The use of computer applications is at the heart of cutting-edge teaching methodologies. Using advanced technologies such as the Internet and computer technology, teachers can make classroom processes more efficient (Tunio, Rashdi & Abro, 2014).

Internet is the fast track that transports data at extremely high speeds among many communicating channels, and these fast-interconnected pathways are more elaborated as information and communications technologies (ICTs) (Freeman & Hasnaoui, 2010). Lindberg and Olofsson (2016) published a paper describing their thoughts on instilling ICT at the university workplace. According to the findings, teachers use information and communications technology (ICT) to manage a variety of tasks. The thoughts and beliefs of teachers were highly beneficial, and without them, the entire scenario of ICT applications for education would become agitated (Zhao, 2013; Heinonen et al., 2019). Teachers' attitudes toward information and communication technology (ICT) found that teachers use ICT to develop the teaching process (Heinonen et al., 2019). Furthermore, ICT helps teachers manage multiple tasks (Schulz et al., 2015); teachers use ICT for classroom activities, better cooperation, personal development (Dabbagh et al., 2019; Ghavifek, 2018). In this study, the use of information and communication technology (ICT) in teaching as a motivational tool in universities is discussed in detail (Avidov-Ungar et al., 2018). Teachers use information and communication technology (ICT) to deliver effective instruction in university classrooms (Mwendwa, 2017).

Researchers Ertmer et al., (2014) examined teachers' perspectives on integrating technology into active working environments. They concluded that teachers' beliefs, courage, and skills for technology operations should be encouraged to integrate technology into active university areas. Zhao (2007), through his work in the social sciences, has helped shape teachers' perspectives on the introduction of modern information and communication technology (ICT) machines in the classroom. Most university teachers are optimistic about their adoption and are courageous in putting them to use. They also argued that training is necessary in order to produce accurate results. Imon (2017) investigated the extent to which information and communication technologies (ICTs) are used in university classrooms. The following are the influential factors that have been discussed in some studies: teachers' thinking and ideas (Kaur, 2019), technical expertise and support (Taimur-ul-Hassan & Sajid, 2013; Audi et al., 2021), technology access (Frost et al., 2017), teachers' technical skills and pedagogical knowledge (Nisar, Munir & Shad, 2011), teachers' professional and personal development (Ali et al., 2015). As a result, integrating ubiquitous technologies with collaborative learning represents a significant challenge for these organizations (Moynes, 2018).

The research conducted by Mwendwa (2017) focused on information and communication technology (ICT) in education. He believes that information and communications technology (ICT) is critical to advancing higher education. As a result of the rapid spread of information and communication technologies, he also hopes to learn more about how universities and colleges will offer future programs. ICT impacts human life in various ways—higher education, industry, education, and entertainment benefit from information and communications technology. Furthermore, information and communication technology (ICT) allows for precise information exchange and systematic research (Audi et al., 2021). According to Huang, Kinshuk, and Price (2014), advanced information and communication technology (ICT) devices are an excellent source of information for all citizens of a country, and they are a much more effective capacity generator and economy stabilizer. Higher education institutions play an essential role in society because they provide equal learning opportunities to all students while also improving higher education systems in general. In both advanced and developing countries, modern technologies have had a significant impact on education. These technologies are essential for developing individual capacity and improving the overall standard of educational institutions in both developed and developing countries. Consequently, better planning of advanced educational technologies that provide a competitive environment for individuals pursuing higher education is required to help developing countries strengthen their economies.

The integration of information and communication technologies (ICTs), primarily the Internet, into teaching, according to Celebi (2019), provides teachers with a great deal of potential for implementing new ways of teaching in the classroom. In larger educational complexes, these modern ICT appliances are effectively integrated into the routine classroom activities of teaching forces, and it is for this reason that teachers' roles as motivators are significant in motivating the learners (Islahi & Nasrin, 2019). Gilakjani and colleagues (2019) investigated teachers' beliefs about the use of computer applications in the classroom and discovered that teachers' beliefs about computers are highly positive and that computers are an effective tool for teaching. They also discovered that teachers should be trained in technology to use it effectively in their classrooms in their teaching practices. A study conducted by Chou, Shen, Hsiao, and Shen (2018) sought to determine how teachers' acceptance of ICT appliances, innovation in educational complexes, and innovation in instructional activities are related to one another through a correlation between them. They discovered that these innovations have a beneficial relationship with one another. The technological potential of teachers is used for educational decisions in Pakistan, according to Iqbal, Ali, and Hassan (2015). This is especially true in the public sector of the country. Furthermore, the study calls for the government's attention to be drawn to the use of advanced information and communication technologies (ICTs). The incorporation of ICT into teaching resulted in the desired outcomes after the study (Islahi & Nasrin, 2019; Lawrence & Tar, 2018; Chou et al., 2018; Gilakjani et al., 2019; Celebi, 2019; Olofsson et al., 2018; Fathima, 2013; Mostafa et al., 2017).

It was decided to use teacher's services in universities in order to improve the quality of teaching because it improves the learning capabilities of students. Teachers were not only expected to be experts in their respective fields of study but they were also expected to be proficient in and use of information and communication technology (ICT). Teachers are facilitators who not only assist the learning force but also serve as the most qualified individuals to integrate fast modes of information and communication technology (ICT) into educational complexes. As a result, the importance of the instructor's role in that complex learning environment should be highlighted. Moreover, they should be able to master these advanced ICT appliances to apply them in the complex process of teaching and learning (Fathima, 2013). In the field of education, incorporating the most up-to-date ICT applications is highly beneficial from a teaching standpoint. It was discovered that university teachers used ICT tools to improve their skills and knowledge. This, in turn, increased the quality of their instruction because it increased their motivation. Teachers who have access to ICT resources within the confines of universities and those who have used these advanced ICT appliances to make their work more accessible and more reliable have benefited from the rapid advancements in technology. Currently, in universities, most instructional and administrative activities are carried out through the use of these high-speed information and communication technologies (Yunus, & Suliman, 2014; Olofsson et al., 2018).

Teachers' perceptions of modern modes of information and communication technology (ICT) for instructional activities are directly related to ICT insertion. It was discovered that teachers have positive attitudes toward using information and communication technology (ICT) appliances in the classroom and for various classroom activities. Significant investments are made possible in information and communications technology (ICT), a critical instrument in education in the teaching-learning process. Additionally, how this tool should be learned first, followed by an understanding of how to teach using this tool in the current digital environment (Mostafa et al., 2017).

The survey study conducted by Voelzke et al. (2019) was used to investigate the possibilities for using information and communications technology (ICT) in universities. They may have access to information and communications technology (ICT) resources, and most teachers use these resources in their work. For example, they use smartphones for personal reasons, computers to present lectures in classrooms, and the latest ICT gadgets for various purposes. The introduction of new information and communication technology (ICT) gadgets, particularly tablets and Android applications, has opened up new possibilities in the current daily lives of educational institutions. Teachers in the present day employ a variety of ICT resources in their classroom activities. Teachers use computer software in their classrooms to enhance their teaching practices. They should also be trained in using these software programs so that they can use them appropriately and effectively in their daily classroom activities (Gilakjani et al., 2019). The use of computer applications for creative learning in conjunction with advanced teaching methods has a longer-lasting

positive effect on educators. Authors from all over the world have the same taste in their research (Aziz-Mohammadi & Samadi, 2014). Siddiquah and Salim (2017) investigate the possibilities available at universities when information and communications technology (ICT) is used. According to the study's findings, the vast majority of teachers use multimedia to make their lectures more engaging. They also used Microsoft Word for various tasks, Microsoft Excel for mathematical calculations, and PowerPoint to present their lessons to the class. Teachers were observed to use the Internet and computers in various classroom activities, and even higher-level administrators used these ICT devices to browse the Internet for teaching materials and frequently used the e-mail facility for communication, which was found to be beneficial for the overall improvement of education (Padmavathi, 2013).

Advanced information and communication technologies (ICTs) have brought about some remarkable innovations in the instructional work of teachers, which has resulted in a more effective educational environment. Teachers have become more productive due to technological advancements, and these advancements have created a challenging working environment for the teaching force in better-equipped learning rooms. This new generation of technologically advanced classrooms has completely transformed traditional classrooms into more advanced technology-based classrooms, which results in the most cooperative learning environment for all students (Khan et al., 2015). It was discovered that the availability, accessibility, and competence of modern ICT resources at private universities and the competence of the users have an impact on the learning process. These newly developed tools are being used to develop the skills of the teaching faculty at these private educational institutions. The learning individuals at the same universities believe that information and communication technology (ICT) tools are more necessary weapons in the hands of teachers to instill necessary skills in them. Students' learning becomes more valuable, innovative, and evaluative due to this process. The university administration faculty has a vested interest in obtaining such information and communications technology (ICT) devices and equipping university classrooms and computer labs with fast ICT devices to achieve the objectives (Khokar, 2016).

The application of advanced information and communication technology (ICT) media in Pakistani universities transforms the country's current poor economic condition in the education field into a well-established educational economy. For Pakistan's education system to transform, teachers' support for current information and communication technology (ICT) devices is essential, as is resolving the issues that have arisen in raising their educational standards to meet international educational standards. As a result, through the use of advanced media or information and communication technology (ICT), educators can keep up with international advancements in education (Shaikh & Khoja, 2011).

Today's information and communication technology (ICT) forms combine advanced features such as the latest computer resources and fast internet access with more traditional features such as books for information acquisition and blackboards for information presentation. In addition, advanced computer versions make use of the most recent hardware, a variety of software, and high-speed interconnected networks for various purposes. Many developing countries worldwide are incorporating computers into their educational institutions (World Bank, 2016). The availability of advanced digital libraries as sources of knowledge and advanced multimedia learning rooms in higher education institutions is linked to the introduction of computers in these institutions (Wallet, 2014).

Granados and Jaramillo (2019) studied the relationship between gender and information and communication technology (ICT) use at the university level. The findings revealed a significant gender disparity, with male respondents scoring significantly higher than female respondents for advanced ICT applications. On the other hand, Pakistani teachers discuss integrating information and communication technology (ICT) into pedagogical practices, particularly in government universities. Governments in all provinces are attempting to integrate information and communication technologies (ICTs) to improve the quality of the higher education sector (Iqbal et al., 2015).

This advanced era has brought about the emergence of the latest generations of social webs, which provide media-sharing tools for the sharing and creating information. Social media tools are available to you at any time and from any location. Teachers use YouTube facilities for lecture preparation and interaction with students interested in sharing their ideas (Dabbagh et al., 2017). Other tools used (Twitter, wikis, Google, Facebook, and so on) were discovered in some related studies (Dabbagh & Kitsantas, 2012). In the digital

age, technology is widely available, and teachers have access to information and communications technology (ICT) resources (Chen, 2010), as these tools are effective for a variety of tasks that produce better results. University computer labs are well-equipped, and internet access is available for teachers. According to the findings of the Tabassum and Shehzadi (2018) study, ICT use in Pakistan is at an early stage and will take time to become more developed. The most severe issue is teachers' lack of confidence in using ICT gadgets for classroom activities, even though university labs are well-equipped and most teachers use computers as a teaching tool. Because of this, teachers who lack ICT skills may not feel confident enough in their ability to apply technologies in their professions. As a result, to reform their future, it is necessary to provide teachers with the necessary training in the use of the latest ICT appliances. Additionally, it raises the level of competence in implementing these cutting-edge teaching methods in their active working environments, intending to improve the overall quality of higher educational complexes for future generations.

Some teachers refuse to use information and communication technology (ICT) in their classrooms; even though university teachers have access to modern ICT gadgets, they do not use them properly. Based on another piece of work, it has been discovered that some elements were found to be ineffective in achieving better results. Teachers' reluctance, their level of confidence in their abilities, inadequate training, and poor organization were all factors. As a result of the positive learning outcomes achieved through applying these factors, educators are eager to see technological advancements in the field of education (Shaikh, 2009). Technology has become widely available in the digital age, and new technological concepts have been introduced into the educational process. Researchers and instructors began working together to develop information technology gadgets, hypertext, multimedia, and networking to create cognitive and constructivist learning environments that would aid in the progression of the learning process. They were found ineffective when it came to achieving better learning outcomes when compared to those obtained through traditional instructional methods (Ali, Riaz, & Wattoo, 2018).

Nikolopoulou and Gialamas (2016) emphasized two critical factors for teachers using advanced information and communication technology (ICT) gadgets. Among these were the teacher's self-assurance and the essence of pedagogical skills in utilizing the most up-to-date information and communication technologies in various classroom activities. Many studies have found that the single most significant obstacle that prevents teachers from incorporating ICTs into their daily routines is a lack of confidence in their abilities. As a result, teachers are hesitant to use old approaches in their teaching activities due to a lack of confidence, difficulty managing time, a lack of availability of the latest software, and knowledge about how to incorporate ICT (Miima & Mavisi, 2013). Teachers' lack of confidence and lack of ICT skills, on the other hand, are two other factors that prevent them from incorporating ICT into their classrooms. As a result, teachers who do not possess adequate ICT skills may not be confident in applying these technologies in their profession (Cubukcuoglu, 2013).

### **III. RESEARCH METHODOLOGY**

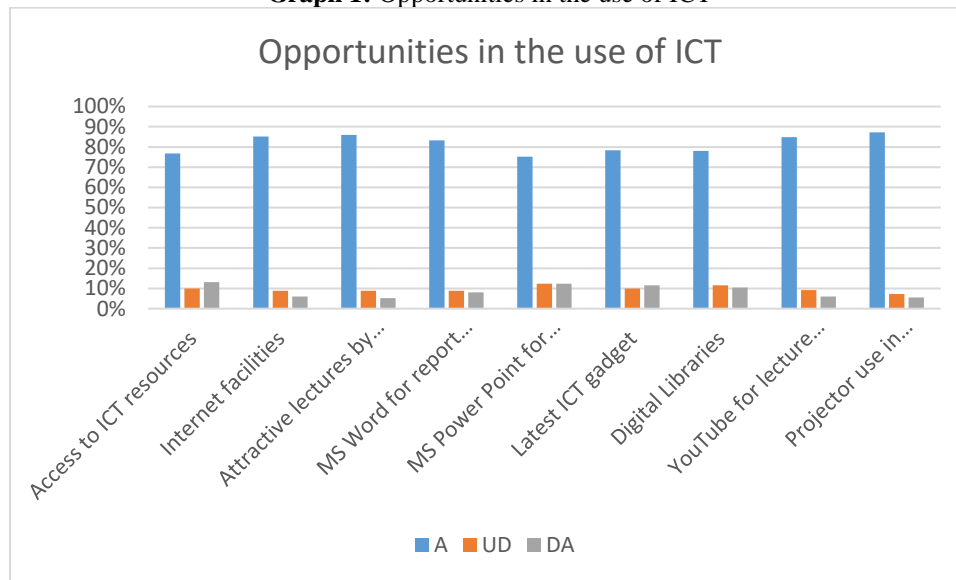
It was determined that there were both opportunities and challenges in using information and communication technology in university classrooms during this investigation. The information for the study was gathered from university professors to achieve the study's objectives. The participants in the study were all of the university teachers in the Lahore division, which was the subject of the study. A simple random sampling technique was used to collect data from the study's population, and the faculty of social sciences was selected as the study's target population by the researchers during the data collection process. Teachers were asked to complete a questionnaire as part of the research process to collect the necessary data. They were determined to be the most appropriate and suitable for answering the research questions posed, which served as the basis for this study. Questionnaires are used to collect information from a more significant number of people. Whenever they are administered quickly, and without revealing the individual responses of any respondent, these are proving to be a valuable source of information (Kombo & Tromp, 2006). Gay (2012) defines it as a pre-planned set of questions that receive responses from a population from which information is required based on their perceptions. A good research study is dependent on the validity and reliability of its instruments, as well as the procedure that was used to conduct the research. Data that is not valid and reliable is worthless and, at the worst, misleading if the methods used are not valid and reliable. This allows for the collection of accurate and dependable information from the respondents. Every effort was made to arrange each item in the most convenient

location possible to collect relevant information from the respondents who were included in the sample. Furthermore, to determine the instruments' reliability, they were tested on university professors (20). Generally speaking, the Cronbach's Alpha value was 0.83, which falls between the ranges of (.65 –.95). The researcher made every effort to arrange each item of the questionnaire in the most appropriate location to obtain the most relevant information.

Questionnaires were distributed to 300 university teachers, who were also given instructions on how to complete the questionnaires in their respective fields. The questionnaires were filled out and returned to the researchers in person, resulting in a response rate of 83 percent for the study. The researchers made every effort possible to obtain valid and reliable information from the respondents, and they were successful. Finally, the data from the respondents (a total of 250 people) was included in the data analysis process. The data was analyzed using SPSS 21, and the graphical presentation in the form of percentages was created based on the findings of the data analysis section.

#### IV. DATA ANALYSIS

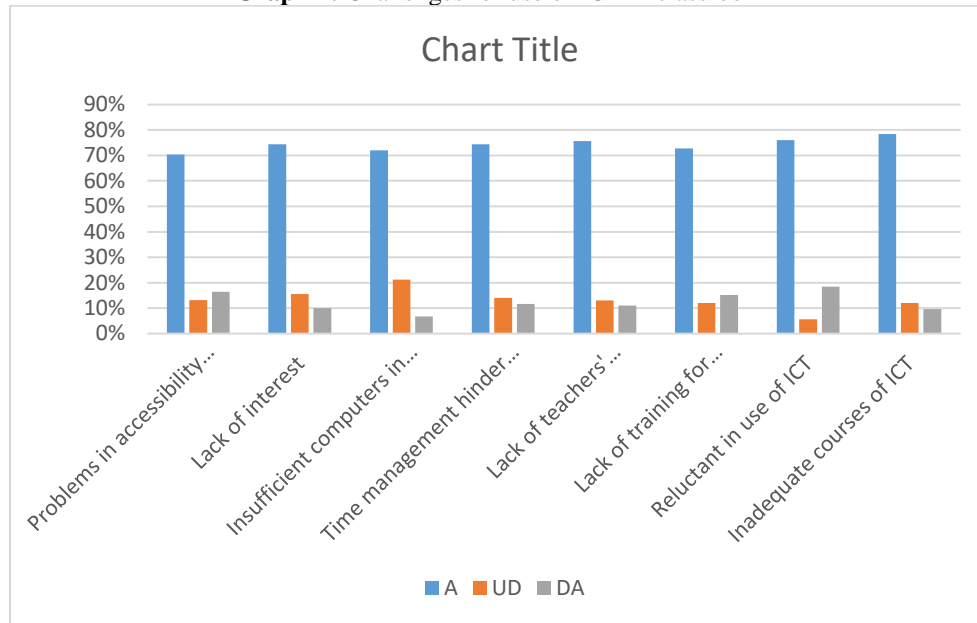
**Graph 1: Opportunities in the use of ICT**



Graph 1 indicates the possibilities of ICT use in universities. In the above table, the means score and standard deviation rises from (3.85 to 4.24) and (.833 to 1.133) respectively that show the inclination of majority of the university teachers (more than 75%) agreed to the statements. It is a good sign for academic circles that majority of teachers (87.2%) use projector in the classrooms; they (86%) also make their lectures attractive and interesting through multimedia. Teachers (85.2%) have internet availability; so they (84.8%) prepare their lectures by taking guidance from youtube videos. Teachers (83.2%) use microsoft word for report writing purposes. Teachers (78%) response that they make the use of digital libraries for enhancing their knowledge.

Graph 2 indicates the hurdles in the use of ICT resources and gadgets in universities. In the above table, the meas score and standard deviation rises from (3.74 to 4.01) and (.957 to 1.198) respectively that show the inclination of majority of the university teachers (more than 70%) agreed to the statements. Teachers (78.4%) have the perception that there are inadequate number of ICT related courses in the universities. They (76%) have the view that universities teachers reluctance is a big hurdle in the use of ICT in universities. Another important perction of teachers (75%) is that they have lack of technical knowledge regarding information communication technology use. Whereas teachers (72%) having the view that there are insufficient number of computers in computer labs.

**Graph 2: Challenges for use of ICT in classroom**



## V. FINDINGS AND CONCLUSIONS

The study's findings investigated the possibilities of ICT use in universities. It was discovered that teachers had access to ICT resources within the university's premises and that they also used the internet to make their work more accessible and more reliable, as revealed by the study findings. On the other hand, they made their lectures more fascinating and attractive by incorporating multimedia into their presentations. Teachers used Microsoft Word to make their work easier, mainly when it came to reporting writing. The majority of teachers used digital libraries to expand their knowledge and become more aware of the most recent developments in the field. They also used the most up-to-date information and communication technology (ICT) tools to transmit their knowledge to the students acceptable, and teachers used YouTube for lecture preparation. Regarding challenges to the use of information and communications technology in universities, the findings of the study concluded that there are an insufficient number of computers in computer labs and an insufficient number of ICT related courses taught in universities, which is due to a lack of technical knowledge based on technology and an insufficient number of computers in labs, among other things. Their time is not well managed, and they have difficulties gaining access to ICT resources; as a result, they demonstrate a lack of interest, are reluctant and lack sufficient confidence in the use of advanced ICT devices and technologies. In addition, it is explored that there is a good association between the use of ICT and teachers having opportunities to utilize ICT resources and tools, although they are experiencing difficulties in using ICT resources and products. As a result, university teachers who employed ICT tools in their classrooms to improve their teaching skills and knowledge found that the quality of their instruction increased due to the increased teachers' motivation and increased productivity of the classroom. They employed information and communication technology (ICT) to manage a variety of duties, including ordinary classroom operations, personal use, teacher professional development, and, lastly, improved collaboration. Universities today are integrating their academic faculty with cutting-edge technology gadgets to streamline their students' teaching and learning process. As a result, they are incorporating projectors and multimedia into their classrooms. The effective use of information and communications technology (ICT) in Pakistani universities to develop professional thinking and the personal betterment of instructors reduced the lack of variables that deactivate university teachers in their active working environments.

Mkpa and Ekoh-Nweke (2019) discussed how teachers' professional and self-development could only be achieved through information and communication technology (ICT), which enables teachers to effectively use technology in classrooms to improve teachers' quality of teachers higher education institutions. According to the findings of this study, teachers' technical knowledge, an insufficient number of ICT-related courses, and a lack of teacher training are the most significant roadblocks to their professional and



self-development. Although a limited number of workshops, seminars, and conferences are held at the university level, this is insufficient to meet the primary goals and ensure the proper integration of technology into the teaching-learning process. According to the findings of the Granados and Jaramillo (2019) study, the most often used ICT tools in education are Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. According to this study, these three technologies (Microsoft Word, Microsoft Excel, and Microsoft Power) are also widely employed by teachers in their instructional activities. It was discovered in the Gilakjani et al. (2019) study that teachers should be trained in technology because they use it effectively in their classroom teaching practices. This study also discovered that most university teachers effectively use ICTs in their teaching practices.

## REFERENCES

- Ali, G., A.Haolader, F., & Muhammad, K. (2013). The role of ICT to make teaching- learning effective in higher institutions of learning in Uganda. *International Journal of Innovative Research in Science, Engineering and Technology*, 2(8), 4061-4073.
- Ali, M. Q., Nargis, N., Yasmeen, R., & Iqbal, Z. (2015). ICT use for effective teaching- learning process in secondary schools in Punjab province. *Asian Journal of Social Sciences and Humanities*, 4 (3), 138-143.
- Ali, M. Q., Riaz, H., & Wattoo, R. M. (2018). Role of Information Communication Technology in Developing Academic Intimacy among Secondary School Students. *International Journal of Distance Education and E-Learning*, 3 (2), 1-12.
- Audi, M., Ali, A., & Al-Masri, R. (2021). Determinants of Advancement in Information Communication Technologies and its Prospect under the role of Aggregate and Disaggregate Globalization. MPRA.
- Audi, M., Ali, A., & Roussel, Y. (2021). *The Advancement in Information and Communication Technologies (ICT) and Economic Development: A Panel Analysis*. University Library of Munich, Germany.
- Avidov-Ungar, O., & Amir, A. (2018). Development of a teacher questionnaire on the use of ICT tools to teach first language writing. *Computer Assisted Language Learning*, 31(7), 675-693.
- Aziz-Mohammadi, F., & Samadi, F. (2014). The impact of call on improving Iran students' accent. *Indian Journal of Scientific Research*, 7(1), pp. 794- 798.
- Azmi, N. (2017). The benefits of using ICT in the ELF classroom: From perceived utility to potential challenges, *Journal of Educational and Social Research*, 7(1), 111-118.
- Bhattacharjee, B. & Deb, K. (2016). Role of ICT in 21st century's teacher education: *International Journal of Education and Information Studies*, 6(1), 1-6.
- Bhattacharya, I. & Sharma, K. (2007). India in the knowledge economy: An electronic paradigm. *International Journal of Educational Management*, 21(6), 543-568.
- Bingimlas, K. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science & Technology Education*, 5(3), 235-245.
- Celebi, N. (2019). Teachers and ICT's in secondary education: The Turkish case. *International Journal of Technology in Education and Science (IJTES)*, 3(1), 19-28.
- Chen, R. J. (2010). Investigating models for preservice teachers' use of technology to support student-centered learning. *Computers & Education* in Press.
- Chou, C., Shen, C., Hsiao, H., & Shen, T. (2018). Factors influencing teachers' innovative teaching behaviour with information and communication technology (ICT): the mediator role of organizational innovation climate, *Educational Psychology*.
- Cox, J. (2017). A teacher's professional development goals.
- Cubukcuoglu, B. (2013). Factors enabling the use of technology in subject teaching. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 9(3), 50-60.
- Dabbagh, N., & Kitsantas, A. (2012). Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education*, 15(1), 3-8.
- Dabbagh, N., Fake, H., & Zhang, Z. (2019). Student Perspectives of Technology Use for Learning in Higher Education.

- Ertmer, P.A., Ottenbreit-Leftwich, A., & Tonduer, J. (2015). Teacher beliefs and uses of technology to support 21st century teaching and learning. In H. Fives & M. Gills (Ed.), *International handbook of research on teachers' beliefs*. New York, NY: Routledge.
- Fathima, S. (2013). Challenges of ICT in teaching learning process. *International Journal of Engineering and Science*, pp. 51-54.
- Freeman, I., & Hasnaoui, A. (2010). Information and communication technologies (ICT): A Tool to Implement and Drive Corporate Social Responsibility (CSR). Paper presented at 15th International Conference of the Association Information and Management 2010, AIM 2010.
- Frost, L., MacLeod, K., & Laronde, G. (2017). Challenges in providing information and communication technology (ICT) education in aboriginal Canadian schools: *International Journal of Digital Society (IJDS)*, 8(1), pp. 1251-1259.
- Frydrochov-Klimova, B., & Poulova, P. (2014). *ICT as a Motivational Tool in the Learning of Foreign Languages*.
- Fu, J. S. (2013). ICT in education: A critical literature review and its implications. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 9(1), 112-125.
- Ghavifekr, S. & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science (IJRES)*, 1(2), 175-191.
- Gilakjani, A. P., Sheikhy, R., Montashery, I., & Alizadeh, M. (2019). A Mixed Method Study of Teachers' Attitudes towards Computer Pronunciation Software in Teaching English Pronunciation. *International Journal of Instruction*, 12(1), 821-840.
- Granados, S. H. B., & Jaramillo, M. L. A. (2019). Learning styles and the use of ICT in university students within a competency-based training model. *Journal of New Approaches in Educational Research*, 8(1), 2254-7339.
- Hazita-Azman, A. S., Hussin, S., Hasim, M. S., & Hassan, M. A. (2014). Determining digital maturity among ICT users in Malaysia. *Malaysian Journal of Communication*, 30(1), 23-35.
- Heamealeainen, R., De Wever, B., Nissinen, K., & Cincinnato, S. (2019). What makes the difference—PIAAC as a resource for understanding the problem-solving skills of Europe's higher-education adults? *Computers & Education*, 129, 27–36.
- Heinonen, K., Jaaskela, P., Hakkinen, P., Isomaki, H., & Hamalainen, R. (2019). University teachers as developers of technology-enhanced teaching—do beliefs matter? *Journal of Research on Technology in Education*, 1-17.
- Hevko, I. (2019). Information technologies in education: opportunities and negative consequences. *Journal of education, health and sport*, 9(1), 69-77.
- Huang, R., Kinshuk, & K. Price, J. (2014). ICTs as transformative enabling tools in education for sustainable development. *ICT in Education in Global Context: Emerging Trends Report 2013–2014*, Springer Heidelberg New York Dordrecht London.
- Imon, M. M. I. I. (2017). ICT integration in secondary education in Bangladesh: A study of policy and practice, *M.Phil. Thesis*, department of education, faculty of educational Sciences, University of Oslo.
- Iqbal, M. N., Ali, M. Q., Hassan, U. M., & Alamgeer, M. (2015). Information Communication Technology in secondary/higher secondary schools in Pakistan: Application and Practices. *Journal of Institute of Social Sciences*. BZU Multan: Pakistan.
- Islahi, F., & Nasrin. (2019). Exploring teacher attitude toward information technology with a gender perspective. *Contemporary educational technology*, 10(1), 37-54.
- Kaur, H. (2019). Teachers' opinions on ICT as a teaching tool in teaching and learning process. *Hawaii University International Conferences Arts, Humanities, Social Sciences & Education*, January 3 - 5, 2019, Prince Waikiki hotel, Honolulu, Hawaii.
- Khan, M. S. H., Hasan, M. & Clement, C. K. (2015). Barriers to the introduction of ICT into education in developing countries: the example of Bangladesh. *International Journal of Instruction*, 5(2), pp. 61-80.
- Khokar, A. J. (2016). Students and teachers perceptions of ICT use in classroom: Pakistani classrooms. *The Asian Conference on Technology in the Classroom 2016 Official Conference Proceedings*.

- Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption and integration of ICT in teaching-learning process. *Educational Media International*, 55(1), 79-105.
- Lindberg, J. O., & Olofsson, A. D. (2016). Contrasting views: student and teacher perceptions on ICT in education, *ICICTE 2016 Proceedings*, 1-10.
- Lubis, A. H., Idrus, S. Z., & Sarji, A. (2018). ICT usage amongst lecturers and its impact towards learning process quality. *Jurnal Komunikasi, Malaysian journal of communication*, 34(1), 284-299.
- Miima, F., Ondigi, DS. & Mavisi, R. (2013). Teachers' perception about integration of ICT in teaching and learning of Kiswahili language in secondary schools in KENYA. *International journal of arts and commerce*, 2(3), 27-32.
- Mikre, F. (2011). The role of information communication: Review article with emphasis to the computer and internet. *Ethiopian Journal of Education and Science*, 6(2), 1-16.
- Mkpa, M. A., & Ekoh-Nweke, AC. (2019). Professional self-development strategies of basic education teachers in Abia state, Nigeria. *European journal of education studies*, 5(10), 19-32.
- Mostafa, J., Hashemi, S. A., Sosahabi, P., & Berahman, M. (2017). The role of ICT in learning – teaching process: *World scientist news*, 72, 680-691.
- Moyne, M. (2018). The development and evaluation of DEFT, a web-based tool for engineering design education. *IEEE Transactions on Learning Technologies*, 11(4), 545–550.
- Mwendwa, N. K. (2017). Perception of teachers and principals on ICT integration in the primary school curriculum in Kitui County, Kenya: *European Journal of Education Studies*, 3(7), 408-430.
- Nikolopoulou, K., & Gialamas, V. (2016). Barriers to ICT use in high schools: Greek teachers' perceptions. *Journal of computer education*, 3(1), 59–75.
- Nisar, M. W., Munir, E. U., & shad, S. A. (2011). Usage and impact of ICT in education sector; A study of Pakistan. *Australian journal of basic and applied sciences*, 5(12), 578-583.
- Olofsson, A. D., Lindberg, O. J., Fransson, G. (2018). Students' voices about information and communication technology in upper secondary schools: *The international journal of information and learning technology*, 35(2), 82-92.
- Padmavathi, M. (2013). A survey of secondary school teachers' perceptions, competency and use of computers. *International journal of education and psychological research (IJEPR)*, 2(4), 7-16.
- Roy, S. D. (2015). Application of ICTs in teaching-learning process. *International Research Journal of Interdisciplinary & Multidisciplinary Studies (IRJIMS)*, 7(1), 72-84.
- Schulz, R., Isabwe, G. M., & Reichert, F. (2015). Investigating teacher's motivation to use ICT tools in higher education. *Conference Paper, Research gate*.
- Shaikh, Z. A. (2009). Usage, acceptance, adoption, and diffusion of information and communication technologies in higher education: A measurement of critical factors. *Journal of Information Technology Impact (JITI)*, 9(2), pp. 63-80.
- Shaikh, Z. A., & Khoja, S. A. (2011). Role of ICT in shaping the future of Pakistani higher education system. *The Turkish Online Journal of Educational Technology*, 10(1), 149-161.
- Siddiquah, A., & Salim, Z. (2017). The ICT facilities, skills, usage, and the problems faced by the students of higher education: *EURASIA Journal of Mathematics Science and Technology Education*, 13(8), 4987-4994.
- Sipila, K. (2014). Educational use of information and communications technology: Teachers' perspective. *Technology, Pedagogy and Education*, 23(2), 225–241.
- Tabassum, S. & Shehzadi, K. (2018). ICT Awareness among Faculty Members of the Public Sector Women Universities of Pakistan: *Proceedings of the RAIS Conference*, 128-144.
- Taimur-ul-Hassan & Sajid, A. R. (2013). ICTs in learning: Problems faced by Pakistan. *Journal of Research and Reflections in Education*, 7(1), 52 -64.
- Tartarashvili, M. (2017). ICT in education: The context-specific characteristics and challenges for developing countries based on the example of Georgia, *Master's Thesis*, Tallinn university of technology, faculty of business and governance.
- Toro, U., & Joshi, M. (2012). ICT in higher education: Review of literature from the period 2004-2011. *International Journal of Innovation, Management and Technology*, 3(1), 20-23.
- Tunio, M. N., Rashdi, P. I. S., & Abro, Q. M. M. (2014). Evaluation of ICT education in private secondary schools: a case study of Hyderabad, Sindh Mehran University. *Research Journal of Engineering & Technology*, 33(1), 43-48.

- Umar, I. N., Tarmizi, M., & Yusoff, M. (2014). A study on Malaysian teachers' level of ICT skills and practices, and its impact on teaching and learning. *Procedia - Social and Behavioral Sciences*, 116, 979 – 984.
- Voelzke, M. R., Paganotti, A., & Assis, A. M. M. (2019). Teaching conceptions on the use of digital technologies as a teaching resource in physical education in public schools of Minas Gerais, Brazil. *EPJ Web of Conferences* 200, 02005 (2019) ISE2A 2017.
- Wahyudi, R., Poernomo, D & Puspitaningtyas, Z. (2018). Effect of Information Technology, Satisfaction and Motivation to Teacher Performance: *The International Journal of Social Sciences and Humanities Invention* 5(1), 4370-4378.
- Wallet, P. (2014). *ICT in Education in Asia: A Comparative Analysis of ICT Integration and E-Readiness in Schools across Asia*. Montreal, Canada: UNESCO.
- Watson, S. L., & Watson, W. R. (2011). The role of technology and computer-based instruction in a disadvantaged alternative school's culture of learning. *Computers in the Schools*, 28(1), 39-55.
- Wentzel, K. R., & Miele, D. B. (Eds.). (2016). *Handbook of Motivation at School. Second Edition Educational Psychology Handbook Series*. New York, USA: Routledge.
- World Bank (2016). Technology and innovation in Education.
- Yunus, M. MD., & Suliman, A. (2014). Information & Communication Technology (ICT) tools in teaching and learning literature component in Malaysian secondary schools. *Asian social science*, 10 (7), pp. 136-152.
- Zhao, Y. (2007). Social studies teachers' perspectives of technology integration. *Journal of Technology and Teacher Education*, 15 (3), 311-333.
- Zhao, Y. (2013). Recent developments in technology and language learning: Literature review and meta-analysis. *CALICO Journal*, 21(1), 7-27.