COVID-19 &Elearning: Perceptions &Attitudes Of Teachers Towards E-Learning Acceptancein The Developing Countries

Khadija Alhumaid, Sana Ali, Anbreen Waheed, Erum Zahid, Mohammed Habes

Article Info	Abstract
Article History Received: July 16, 2020 Accepted: September 30, 2020 **Keywords** eLearning; Covid-19; Technology Acceptance; Perceived Usefulness; Perceived Ease of Use; Learning; Education **DOI:** 10.5281/zenodo.4060121	*E-learning is replacing the traditional classroom environment worldwide. Especially during the current Covid-19 outbreak, eLearning is a crucial source to continue educational activities. In this regard, this micro-level study aims to examine the teachers' perceptions regarding online learning as a substitute for formal education. By using the Technology Acceptance Model (TAM) as the conceptual framework, the researchers selected a brief sample of n= 30 university-level instructors from Rawalpindi, Pakistan. Further to affirm the study hypotheses, the researchers also conducted multiple regression analyses. Findings revealed a positive relationship between technology acceptance and eLearning during Covid-19 in Pakistan. Overall, the respondents expressed a favorable opinion concerning eLearning acceptance during the lockdown situation and its impacts on students' academic performance. However, due to weak infrastructure, the Education Ministry of Pakistan is also facing several challenges in implementingthe eLearning system. Also, access to eLearning and students' indifferent attitude towards online learning are significant challenges. Thus the researchers recommend more studies to highlight teachers' opinions regarding the significance of eLearning. Therefore, the current study will not only help the local government to introduce practical strategies but also motivate students to accept eLearning as an essential part of their educational journey.*

1. Introduction

The rise of the Corona Virus launched significant concerns for the global healthcare system. Having a primary zoonotic source, Covid-19 is creating several challenges for the whole world (WHO 2020). The first significant outbreak of Coronavirus was recorded in December 2019 from Chin's 7th most populous city Wuhan. Within a few days, the virus spread to other countries, including Iran, Italy, and other countries. The first confirmed case outside China diagnosed on January 17 in Bangkok, Thailand. During March 2020, more than 67 countries reported confirmed cases with more than 132 deaths (WHO 2020). However, due to briskly increasing cases, it is difficult to estimate the total number of cases due to limited access and thousands of unregistered cases.Moreover, despite many claims, the spread of Coronavirus is continued, and the number of cases is briskly increasing worldwide(Di Gennaro et al., 2020; Habes, Alghizzawi, Ali, et al., 2020) To hamper the virus transmission, healthcare organizations introduced many safety measures such as wearing face masks, social distancing, self-isolation (if diagnosed positive), and even complete lockdown in many countries. In this regard, social distancing is a traditional and most effective technique to hamper virus transmission. Historically, healthcare professionals overcame Severe Acute Respiratory Syndrome (SARS 2003), Middle East Respiratory Syndrome (MERS 2012), ZIKA, EBOLA, and others by using the same methods of social distancing and isolation (Habes, Alghizzawi, Ali, et al., 2020). For this purpose, many countries imposed lockdown, curfew, and even travel restrictions. Initially, China imposed lockdown to restrict virus transmission within the state. Gradually the other territories such as Iran, Germany, Australia, Belgium, UK, France, Belgium, and others also followed the same process, resulting in a significant decrease in the number of cases (Aslam, 2020). According to (EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL, 2020), social distancing and lockdown being non-pharmaceutical countermeasures are specially designed by the local governments to reduce the risk of virus transmission. Especially during the current pandemic, they minimized the physical contact and, thus, are capable of reducing risk factors. However, social distancing and lockdown in many countries adversely affected daily life activities in general. (De Vos, 2020) and despite effective measures, still, the outbreak is demanding much more efforts to counteract against it (S. Ahmad, 2020).

Although lock downtown and social distancing brought positive outcomes, they also led to the immediate closure of educational institutions (Figueiredo et al., 2020). These nationwide closures are affecting more than 80% of young students, adversely affecting their educational activities. Institutions are facing considerable challenges to counteract against these challenges by resorting to distance learning systems(UNESCO, 2020a).

Despite the current pandemic hampered education all over the world, virtual learning and ease of access to internet services highlight facilitated the learning system. Schools, colleges, universities, and instructors instantly adopted online sources to continue their educational journey through video conferencing applications and modules (International Labour Organization, 2020). As noted by (Habes et al., 2019), improved communication technologies mostly facilitated the learning systems as accessibility to Social Media is a useful source of information and communication. Both students and teachers consider online technology as a positive part of their learning system. Even besides online sources, many countries also launched television broadcast to support distance learning during the pandemic (UNHCR, 2020). For (Sultan Alam, 2020), prioritizing distance learning,primarily through online systems, is a "paradigm shift in education." The jammed wheels of education raised certain uncertainties regarding the future of students, but it also highlighted the significance of technology in our lives. In this regard, (Muhaisen, 2020) also considered online learning as a useful tool to overcome educational challenges. Generally, both students and teachers are equally responsible to accept online learning which helps to continue the learning process as access to education is today more convenient through online learning systems (Ali, 2019). However, many argue that the current crisis is not a normal shift from formal to informal education rather, it is an educational crisis as well. Thus, if tackled strategically, this urgent shift can bring several positive outcomes for both the students and the instructors (Adnan, 2020).

Therefore, this study aims to explore the mechanism regarding eLearning acceptance, adoption, and integration during the Covid-19. For this purpose, the researchers chose instructors by using the possible data gathering means. In this regard, the first part of this article will give a brief overview of the existing Covid-19 scenario in Pakistan, in the second phase the researchers will discuss some relevant studies witnessing the primary mechanism behind eLearning acceptance in the educational context. In the fourth section, the researchers will analyze and represent the results, and finally, the findings will be extensively discussed.

1.1 Covid-19 in the developing countries:The case of Pakistan

Pakistan is currently in a state of health emergency because of deadly disease coronavirus COVID-19. The geographical location of Pakistan escalates COVID-19 cases, as neighbor countries are hugely affected (Rubi et al., 2020). On February 26, 2020, the Ministry of Health, Government of Pakistan, confirmed the first two COVID-19 cases in Karachi and Islamabad, respectively. Both patients were pilgrims and came back from Iran (Manzoor, 2020). Within a few days, the figure of positive COVID-19 reached 20, out of which 14 cases were from Sindh, five from Gilgit-Baltistan, and one claim from Baluchistan (Saqlain et al., 2020). As of August 11, 2020, 285,189 cases recorded, with a total of 6,112 deaths (Government of Pakistan, 2020). These circumstances indicated a major health crisis with an extraordinary burden of disease along with limited resources, while statistics predicted that the number of affected patients could raise more (Chaudhry et al., 2020). To counteract against the Covid-19 outbreak, the Government of Pakistan introduced several measures, e.g., imposed limitations on traveling, shut airspace, and implemented close monitoring of outsiders (Sarwar et al., 2020). Notably, the government declared the closure of all the educational institutions and public places such as markets, malls, parks, and others, nationwide. The step was essential to mitigate the possible transmission Covid-19 outbreak (Aamir Latif & Islamuddin Sajid, 2020)as traditional methods of social distancing, quarantine, and lockdown were the need of the day (Khalid & Ali, 2020).

Moreover, the Government of Pakistan also took individual steps regarding early screening, clinical facilities, laboratory screening and diagnosis, defensive and regulatory measures containing social distancing, quarantine, and self-isolation (Rana et al., 2020). Similarly, The Pakistan National Institute of Health (NIH) is even playing an essential part in formulating and practicing COVID-19 preventive measures (NIH, 2020). The health establishment of Pakistan also launched public awareness campaigns by using different social media platforms to guide regarding usage and importance of Personal defensive kit, facemasks. Besides,various social institutions are playing a significant role to spread awareness regarding treatment, sample assortment as well as hand and general body sanitization (Hayat et al., 2020). Furthermore, the Government of Pakistan also established the Covid-19 Relief Fund to collect donations for the wellbeing of people and organized special helpdesks into seven native languages (Rana et al., 2020). Ministry of National Health Services Regulation and coordination of Pakistan also approved Specific Hospitals to facilitate treatment with isolation wards (total number of beds 23,557) at the central, provincial, and local levels(Waris et al., 2020). With the collaboration of National Disaster Management Authority (NDMA) and National Institute of Health (NIH) many laboratories also launched Free PCR COVID-19 test, which increased test capacity from 30,000 to 280,000 and later to 900,000 (NIH, 2020).

2. Literature Review:

2.1 Relationship Between Knowledge Sharing through Online Media, Perceived Ease of Use & Perceived Usefulness:

Educational institutions highly prefer online platforms for knowledge sharing and learning purposes. For institutions, knowledge is a commodity, and they prefer to disseminate it by using all means of communication. Today, when we are living in a globalized world, technology usage for knowledge,

information, and learning has become the need of the day (Bakhuisen, 2012). According to(Balubaid, 2013),academic administration on both graduate and undergraduate prefer online platforms for various educational purposes. With the rise of Learning Management Systems, educational institutions give special consideration to online systems to facilitate knowledge sharing in a better possible manner. The researchers further examined knowledge sharing through a web-based system among teachers and students in the Department of Industrial Engineering, King Abdul-Aziz University, Jeddah Saudi Arabia. The researcher selected a cross-sectional approach and obtained data from $n=$ 77 valid responses. Results indicated that respondents highly prefer web-based platforms for knowledge sharing purposes. These sources are easy to use and accessible for them, facilitating knowledge sharing procedures.(Salloum, Al-Emran, et al., 2019; Suebsom & Dahalin, 2014)also examined the knowledge sharing by using online platforms among higher educational institutions in Thailand. The researchers used close-ended, structured questionnaires, and selected a sample of $n=$ 247 students from the Nakhon Si Thammarat Rajabhat University. Results showed that both instructors and students highly prefer online media for knowledge sharing and learning both inside and outside of the classroom environment. For the online media provides an enormous amount of information through easily available and accessible platforms and communication process. Also affirmed by (Gaál et al., 2015), as they analyzed the knowledge and information sharing through digital platforms in Veszprém, Hungary. The researchers used the case study approach and gathered data from $n=$ 299 respondents. Findings revealed that a majority of participants prefer online platforms to communicate and share knowledge about a different phenomenon. Although their organizations do not support much about using digital platforms, they also recommend the individuals to stay connected to manage urgent tasks. Furthermore, (Abdul et al., 2020) investigated the use of online platforms and mobile devices to support knowledge sharing among teachers and students in Higher Education. The researchers used a cross-sectional study design and selected a sample of n= 360 participants from Eastern India. Results showed that due to ease of use, accessibility, and efficient speed, participants consider online media and mobile devices as an important part of the learning process.

An increased online learning adaptation is due to ease of access and positive outcomes. For both students and teachers, online technology facilitates their leaning by providing broader options to learn new things (Ali, 2019). Even in crises, online learning provides unhindered learning and education opportunities to the studentS(Habes et al., 2018; Habes, Alghizzawi, Ali, et al., 2020; Habes, Alghizzawi, Salloum, et al., 2020). In this regard, (Latifah & Thirumeni, 2016) examined the uses of online learning management systems for students at Open University, Malaysia. The researchers used the case study approach and selected a samsle of $n=$ 235 undergraduate students. Results revealed that students' satisfaction and positive impacts on their academic performance were the two most prominent outcomes of preferring online learning. However, a majority of respondents also demanded for an increased technology integration in distance education to avail more significant outcomes. (Hart et al., 2019) also investigated the likelihood of virtual learning and its potential outcomes on students' academic performance. To investigate this phenomenon, the researchers used the Fixed Effects Model and found that, initially, respondents found virtual learning as difficult and unacceptable. However, over time, they started accepting it as an important part of their educational journey, ensuring positive impacts on their overall academic performance. Furthermore, (Habes et al., 2019) scrutinized the acceptance and impacts of eLearning on students learning performance in Amman, Jordan. The researchers used the case study approach and a selected sample of n= 410 graduate and undergraduate-level students. Findings indicated that perceived ease of use and perceived usefulness were the two leading mechanisms supporting eLearning adaptation and usage. Moreover, the respondents also expressed better academic performance and outcomes due to eLearning acceptance and integration. Due to these reasons, eLearning is among the top priorities for educational institutions. Besides students, teachers also take full advantage of eLearning by improving students learning abilities (Muhaisen, 2020). The researcher further analyzed the use of implementing eLearning in English learning courses among higher education institutions in Jordan. The researcher used closed-ended questionnaires and selected a sample of $n=$ 12 instructors from two English language teaching institutes. Results showed that eLearning is positively influencing English language learning among the students. For the instructors, they perceive eLearning as an important tool to update their teaching performance.

H1a: There is a positive relationship between Knowledge Sharing and Perceived Ease of Use
H1b: There is a positive relationship between Knowledge Sharing and Perceived Usefulness

2.2 Relationship Between Communication through Online Media, Perceived Ease of Use & Perceived Usefulness:

Although traditional resources of communication are of greater significance, one-third of the global population prefers to communicate through digital platforms to gain better communication and interaction experiences.(Alghizzawi et al., 2019)The presence and extreme importance of online networking are undeniable for introducing a new era of communication (Talpau, 2014).In this regard, (Froment et al., 2017) examined the reasons behind online platforms used for communication between instructors and students worldwide. The researchers used a review approach and selected a sample of $n=$ 96 peer-reviewed research articles published

between 2006 to 2016. Findings revealed that a majority of studies witnessed an increased reliance on online platforms due to ease of use and availability of online services. For both students and teachers, they feel comfortable to communicate with each other due to fast and efficient connectivity provided by the online communication system.(Dickinson, 2017)also analyzedthe use of the learning management system and its impacts on the rapport-building of the potential instructors. (Habes, 2019)The researcher used a quantitative method and obtained data from emails available on learning management system accounts. Results showed that the majority of instructors gave special consideration to communication tone as for the researcher, besides communication feasibility, tone, and style of email also attract students to depend on the online learning system. Thus, the researcher concluded communication through the online system, a blend of ease of use, accessibility, and better tone, ensuring improved academic outcomes. Similarly, (Mayende et al., 2017) also witnessed noticeable improvements in education due to the online learning system in Uganda and Norway. The researchers used both quantitative and qualitative approaches, i.e., survey and content analysis methods. Results indicated that students widely preferred the eLearning system besides the traditional classroom environment. For them, eLearning is not a substitute for traditional learning. However, it is helping them to improve their academic performance with ease of use and accessibility. (Saïd Assar, 2019) further argued that learners and instructors acceptance is a key determinant of integrating ICT in learning process. When they perceive online learning as easy to use and access, they deliberately adopt digital technology to gain maximum advantage to improve the overall educational process. The perceived ease of use and accessibility help them to keep pace with the digital learning leading to avail better outcomes as with the rise of online technologies, web-based system is facilitating interaction and communication. User's perceptions regarding online communication are positive, thus increasing their dependency on web-based communication. For this purpose, Social Networking Sites such as WhatsApp, Facebook, Skype, Zoom and others, providing ease of use and benefiting the communication in general (Huang et al., 2019).

According to R. Trebor Scholz(2013) digital learning is a part of students' educational journey. Not only higher education institutions prefer digital learning also, but secondary and high school levels also prefer digital means to improve academic performance. (Trebor Scholz, 2013)Today, students learn through an "online collaborative environment" where everyone has an equal chance to access educational opportunities. To further affirm this, (Munoz et al., 2014) examined the role and importance of Twitter as facilitating teachers' learning and students-teachers interaction in Florida, USA. The researchers used a cross-sectional approach and selected a sample of *n*= 1153 respondents from schools. Findings revealed that Twitter widely facilitated student-teachers' interaction and teacher training programs. Teachers posted education content both for the colleagues and students, and also privately shared with them the additional study material. Thus the researchers concluded that besides interaction, it also provided a sense of belonging and encourage their participation in online educational activities.(Wan Othman et al., 2016) also investigated the use of Social Media for communication and its potential links with academic performance. The researchers used the Descriptive Quantitative approach and selected a sample of n= 200 respondents from TATIUC College. Results showed that 90.5% of respondents use social media for communication purposes. According to the respondents, besides communicating with friends and family, they also interact with their classmates and instructors to avail of additional educational support and guidance. (Chawinga, 2017) further witnessed the use of digital media to facilitate eLearning and communication as they scrutinized the use of blogs and Twitter for facilitating learning and teaching Malawi. The researchers used a case study approached and gathered data by using n= 64 students from Muzu University, Malawi. Results revealed that Twitter and blogs highly benefitted the students due to information availability.(Alghizzawi et al., 2019; Alhawamdeh et al., 2020) Moreover, teachers also motivated students to share and re-share educational content to avail the maximum benefit as various eLearning platforms are easily accessible with numerous opportunities for the users. They provide extra study material and even connect teachers and students. Thus, the importance of online media as a major learning source is undeniable (Derani & Naidu, 2016) as (Abbas et al., 2019) analyzed the impacts of digital media as a communication tool between students from five regions. The researchers used a cross-sectional study design and gathered data from *n*=1013 survey questionnaires. Findings revealed that digital media usage is highly prevalent among students in Pakistan. They use digital media both for communication and interaction for educational and non-educational resources.

H2a: There is a positive relationship between Communication and Perceived Ease of Use
H2b: There is a positive relationship between Communication and Perceived Usefulness

2.3: Relationship between Motivation & usage, Perceived Ease of Use, and Perceived Usefulness:
According to (Saini & Abraham, 2015), digital media largely facilitates the communication, interaction, and information process. Researchers frequently discuss and emphasize the use and integration of information technology in education, which further benefits the learning process. It is an effective way of developing meta-cognitive skills that can benefit both instructors and students to improve their relevant experiences. In this regard, (Özçakir et al., 2015) examined the primary determinants of eLearning among

students in general. The researchers adopted a review approach and selected a sample of n= 58 peer-reviewed research articles. Findings revealed that individuals mostly prefer online media as it is easy to use and accessible almost all around the world. Accompanied by a positive, constructive outcome, people prefer online technology to avail of better communication and educational results.(Yilmaz, 2016) also scrutinized the students' eLearning usage and the role of mobile devices to facilitate accessibility. The researcher used a descriptive approach and selected a sample of $n=$ 113 students from science and engineering departments. Results indicated that the majority of students approach eLearning sites by using their mobile devices as they are widely available and easy to use. The students also consider mobile both software and hardware of their devices as important determinants of accessing eLearning. As noted by(Bauer et al., 2014), almost all undergraduate and graduate-level; institutions prefer eLearning through mobile devices. These devices are easy to use and increase accessibility. Today every student possesses personal mobile, tablets, laptops, and desktops, preferring eLearning as an important part of their educational journal. Also affirmed by (Zachos et al., 2018), as they investigated eLearning usage among students and teachers to boost their educational experiences. The researchers used a review approach and selected peer-reviewed research studies addressing eLearning adopting, determinants, and its impacts on students' academic performance. Results showed that both students and teachers prefer eLearning as a better, smart, and efficient educational method. Although they do not consider it a substitute for formal education still, they highly acknowledge its significance. Similarly, (Salloum, Al-Emra, et al., 2019) analyzed the potential relationship between eLearning usage and perceived ease of use among undergraduate students in Amman, Jordan. The researchers used the case study method and selected a sample of n= 410 local students. Results revealed a strong significant relationship between perceived ease of use and accessibility as a motivation for eLearning adoption. In short, technology is easily available, accessible, and usable, motivating the youngsters to prefer for learning and educational purposes.

According to Salloum(2019) perceived usefulness is a primary determinant of technology integration and adoption(Aristovnik et al., 2016) Especially, adopting and integrating technology is improving the pedagogical learning and education process. The new generation readily accepts and adopts technology, which can help to avail of better learning opportunities. Also, validate by (Punnoose, 2012), as they analyzed the determinants of eLearning acceptance among the graduate-level students in Thailand. The researcher selected a descriptive quantitative approach and selected a sample of n= 249 local students. Results revealed that due to the perceived benefits of eLearning, respondents adopted eLearning. For them, eLearning provides them ease of access and communication, which further helps to improve their academic performance. Likewise, (Tabak & Nguyen, 2013)examined the determinants of eLearning among students in the United States. The researchers used a systematic review approach and utilized peer-reviewed research articles. Findings revealed that self-regulation is the most prominent mechanism for eLearning adoption among the students. For the respondents, technical support, service availability, ease of usage all are the motives behind eLearning adoption.(Aristovnik et al., 2016) further scrutinized the motives for eLearning acceptance among eLearnersat the University of Ljubljana, Slovenia. The researchers selected a case study method and selected a sample of n= 13 different faculties. Results showed that ease of availability, accessibility, and unique structure of the eLearning course motivate students to learn through online sources. Additionally, teachers' positive perceptions regarding eLearning also help the students to adopt technology for educational purposes. Instructors themselves can also use eLearning to provide extra study material and ease of access to their students to improve their academic performance (Ramirez-Anormaliza et al., 2016). Furthermore, (Habes, Salloum, et al., 2020) examined the use of YouTube videos as a prominentsource of eLearning in Jordan. The researchers used the case study approach and gathered quantitative data from n= 360 from local universities in Jordan. Findings indicated that there is a strong positive relationship between YouTube videos and improved academic performance. According to the respondents, YouTube-based eLearning is a primary determinant of their overall educational performance.

H3a: There is a positive relationship between Motivation & Usage and Perceived Ease of Use
H3b: There is a positive relationship between Motivation & Usage and Perceived Usefulness

2.4: Relationship between Perceived Ease of Use, Perceived Usefulness & eLearning Acceptance:
According to (Yuen and Ma 2008), effective academic use of technology relies on instructors' attitudes and acceptance towards technology. To scrutinize instructors'' acceptance to an online learning platform, researchers collected data of $n=152$ teachers (in-service) from Hong Kong. Findings indicated that perceived ease of use among instructors is tremendously vital. The researchers further concluded that growth in perceived ease of use positively affects an individual's intention to adopt e-learning system. As noted by (Chen and Tseng 2012), eLearning is not limited via period or place and can deliver a flexible and suitable learning environment for instructors to enabling advance professional proficiency. Furthermore, (Bhuasiri et al. 2012) classified various factors of successful e-learning systems and collected a sample of $n=76$ individuals by using the Delphi method and Analytic Hierarchy Process (AHP) approach. Findings identified that awareness, motivation, and diversity in learners' performances are basics for successful e-learning enactments. The study also discovered

six dimensions for the execution of e-learning systems in emerging states, including organization and service quality, substructure and system superiority, course, and information quality. To further validate this phenomenon, (Buchanan et al. 2013) conducted an online survey and selected a sample of *n=114* faculty members from Universities ibn the United Kingdom. Results revealed that internet self-efficacy associated with the usage of online learning technology among faculty. Moreover,the faculty's higher engagement with online learning technology could lead to greater internet self-efficacy. The researcher also recommended faculty training and digital literacy for Perceived Ease of Use and ELearning Acceptance. (Elkaseh et al., 2016) argued that eLearning is developing as the novel paradigm of contemporary education reformed the procedure of obtaining and spreading knowledge among students and teachers. Therefore, ICT changed the learning system from an old classroom to an e-learning environment, which enhances the availability of information, accountability, self-pacing, and transferring better consistent content, including a variety of learning resources (Aldowah et al. 2019). However, the case study of (Flavell et al. 2019) concluded, it depends on the capability of academic progress to empower adaptive reactions towards ongoing technological changes.

The Perceived Ease of Use positively affects perceived usefulness, which is essential to measure the success of the e-learning system. Perceived value involves evaluating relative advantages and compatibility as the users are concerned about whether e-learning systems could accomplish the user's job responsibilities or not (Lee et al. 2015). In this regard, (Teo 2011) examined the factors attributed to perceived usefulness in education and learning. The researcher used a descriptive quantitative approach and selected a sample of *n=189* pre-service teachers. Results indicated that perceived value is a multidimensional concept composed of numerous independent variables, i.e., learning atmosphere, course delivery, teacher attribute, and facilitating conditions. The findings of the structural equation model significantly supported the three hypotheses out of four, with 62.5% of the total variance in the pre-service teachers' perceived usefulness of e-learning. According to (Mohammadi2015), in the 21st century, Perceived usefulness is a fundamental element of an intention, which motivates consumers to accept new advanced and user-friendly technologies. To determine the perceived usefulness of e-learning (Elkaseh et al. 2016) also conducted an exploratory analysis and distributed two sets of *n*= 400 questionnaires among students and teachers in Libya. Results revealed that Social Influence is a significant dynamic of attitudinal change to accept e-learning among students and teachers' behavior. However, the Perceived Enjoyment comparatively more effects on teachers' Perceived Usefulness of eLearning.

Moreover, (Priyanto et al. 2017) also assessed the impacts of the social environment and other mechanisms on e-learning acceptance. Data obtained by *n=132* teachers through using the sample Krejcie& Morgan formula indicated that the effects of the social environment and other mechanisms to the e-learning acceptance arbitrated into three core variables of TAM, i.e., perceived usefulness, perceived ease of use, and intention to use.The findings also revealed that a more comfortable e-learning procedure would be beneficial for teachers to modify teachers' output and efficacy.

H4a: There is a positive relationship between Perceived Ease of Use and ELearning Acceptance
H4b: There is a positive relationship between Perceived Usefulness and ELearning Acceptance

3. Research Model & Theoretical Support:

Several studies investigated the students' perceptions regarding eLearning adoption (Habes et al., 2019). However, very few or no investigations enquired about the teachers' perspective concerning acceptance and integration of eLearning in Pakistan during the Covid-19 outbreak (GOP, 2020). To examine this phenomenon, the researchers employed the Technology Acceptance Model with the stated hypotheses. As noted by (Hassan et al., 2019), the Technology Acceptance Model explained perceived ease of use and perceived usefulness in terms of "cognitive process and social influence." Thus, **Figure 1** below supports the technology acceptance, especially during Covid-19.
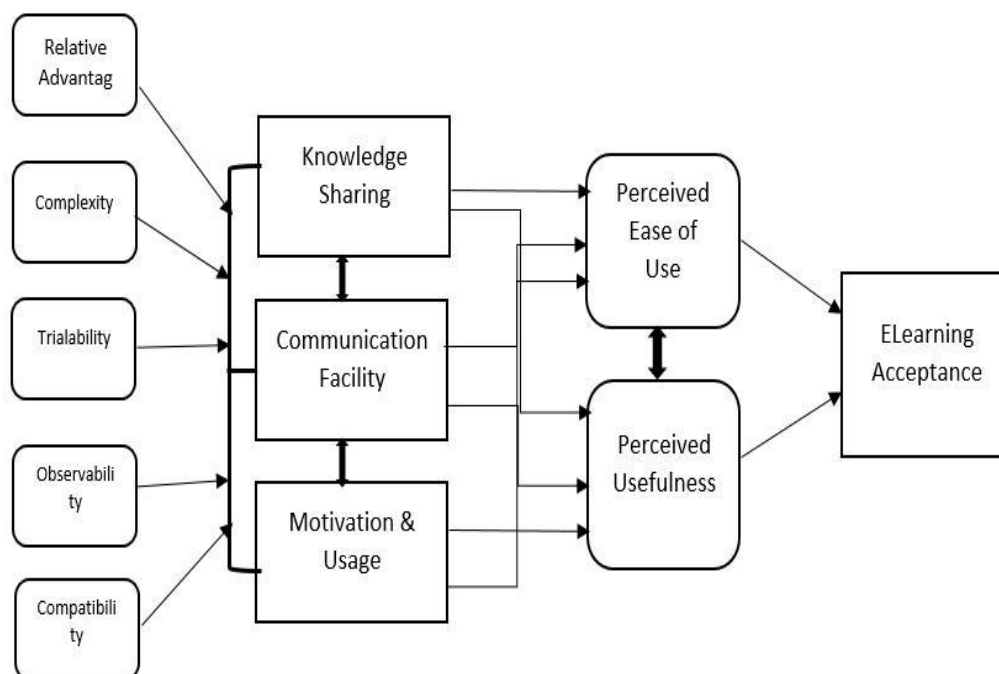
Figure 1 Source: Technology Acceptance Model (TAM)

Furthermore, the Diffusion of Innovation theory by E.M Roger is another concept providing a fundamental theoretical background to the current study. As the theory mainly describes how an idea or object is taken up by the public, perceived as new, unique, and having certain important features (Robinson, 2009). In simple terms, E.M Rodgers theoretically described the assumptions and questions raised by Robert Merton with practical implications (Dearing & Cox, 2018). Similarly, regarding internet-based services adoption, diffusion of innovation provides a basic framework. It describes the background factors, working mainly as the dynamics of technology acceptance (K. F. Alhumaid, 2014; Khadija Alhumaid, 2019; Zhang et al., 2015). As noted by (Chaipoopirutana et al., 2009), complexity, compatibility, observability, relative advantage, and trialability all determine the adoption process and the appropriatebehavior. In this regard, the Technology Acceptance Model and Diffusion of Innovation theory work hand in hand (Shiau et al., 2018).As noted by (Dintoe, 2018), several studies used applied diffusion of innovation to describe the technology acceptance process both on macro and micro levels. By applying it to the Technology Acceptance Model, it simplifies explaining the technology acceptance process. Thus, under the Diffusion of Innovation theory, we can describe the attributes and phases that help to accept and integrate technology in the education system. These attributes determine acceptance or rejection based on specific criteria and age levels (Scott & McGuire, 2017).

4. Methodology

The methodology of our current study is inspired by several previously published investigations (Habes et al., 2019; Ali, 2019;Shane-Simpson et al., 2018;Habes et al., 2020;Muhaisen, 2020). The researcher conducted this study during the Covid-19 pandemic when the outbreak is at its peak and increasing in Pakistan (K Alhumaid, 2020; Saqlain et al., 2020) To obtain data, the researchers used close-ended, structured survey questionnaires, and carefully distributed among the local instructors from Rawalpindi. In the following section, we will discuss the other more details concerning the data gathering process, manipulation, sample, and limitations regarding sample design.

4.1 Population& Sampling:

The study population comprises instructors on school, college, and university level. However, due to certain limitations, including institutional closure and lockdown, the researchers selected a convenient sampling method. As the convenience sampling method involves essential screening criteria (Ramirez-Anormaliza et al., 2016), the researchers selected a brief sample of *n*= 30 respondents from Rawalpindi City. Further, the researchers used web-based services, i.e., email, google survey links, to obtain data by the potential study respondents. The questionnaires contained queries regarding eLearning during Covid-19, its benefits, and perceived impacts on students' academic performance in general.

4.2 Demographical Data:

Table 1 below contains the result of demographical data analysis. Results revealed that 86.7% of participants were females, and 13.3% were males (*M*= 1.13, *SD*= 346). Similarly, 80.0% of respondents between 25 to 34 years, 16.7% were between 35 to 43 years and 13.3% were 44 or above (*M*= 1.23, *SD*= .504). Moreover, 63.4% of participants were from Fatima Jinnah Women University, Rawalpindi, 30.0% were associated with Riphah International University, Rawalpindi, and only 6.6% of participants were from the other institutions (*M*= 2.40, *SD*= .932). The researchers calculated demographical data through IBM Statistical Package for Social Sciences Version 22.

Table 1: Demographical Data of Study Respondents

Criterion	Factor	Frequency	Percentage
Gender	Female	26	86.7%
	Male	04	13.3%
Age	Between 25 to 34	24	80.0%
	Between 35 to 44	05	16.7%
	44 and Above	01	13.3%
Institution Name	Riphah International University, Rawalpindi	09	30.0%
	Fatima Jinnah Women University, Rawalpindi	19	63.4
	Others	02	6.6%

4.3 Research Tool:

The researchers designed a research tool under the supervision of subject experts to ensure its validity. To further examine the reliability, the researchers conducted Intercoder Reliability Analysis. According to (Lavrakas, 2012), Intercoder reliability analysis is a crucial component in survey research, without which obtained data and interpretation is not valid and generalizable. Therefore, the researchers used the Cronbach Alpha test and with the Alpha value *a*= .880; we affirmed that the research instrument is reliable. A detailed overview of intruder reliability analysis is given in Table 2 below:

Table 2: Intercoder Reliability Test

Items	Constructs	Cronbach Alpha	Status
H1	There is a positive relationship between Knowledge Sharing, Perceived Ease of Use	.759	Supported
	There is a positive relationship between Knowledge Sharing and Perceived Usefulness		
H2	There is a positive relationship between Communication, Perceived Ease of Use	.768	Supported
	There is a positive relationship between Communication and Perceived Usefulness		
H3	There is a positive relationship between Motivation & Usage, Perceived Ease of Use	.761	Supported
	There is a positive relationship between Motivation & Usage and Perceived Usefulness		
H4	There is a positive relationship between Perceived Ease of Use and Technology Acceptance	.764	Supported
	There is a positive relationship between Perceived Usefulness and Technology Acceptance		

4.4 Survey Structure:

All the researchers themselves distributed *n*= 30 questionnaires by using electronic mail and WhatsApp. The researchers carefully distributed questionnaires among the respondents from Rawalpindi City, working in public sector educational institutions. Five six of the distributed surveys involved:

1. Demographical data, including respondents' gender, age, and institution.
2. Questions concerning respondents' eLearning awareness in general.
3. Questions regarding knowledge sharing through eLearning as more comfortable, accessible, and useful than formal learning environments during Covid-19.
4. Queries concerning eLearning and ease of communication among the students and instructors during Covid-19.

5. Question regarding motivation factors that are considerably determinants of ease of use and perceived usefulness regarding eLearning adoption during Covid-19.
6. Perceived ease of use and perceived usefulness as causes of eLearning acceptance during Covid-19.

5. Data Analysis and Discussion:
The researchers used Descriptive Statistics to obtain the total frequency and percentage of the responses by using the Statistical Package for the Social Sciences (Frey, 2017). The researchers conducted the statistical analysis in two phases: (i) First, they calculated the percentages and frequencies of the demographical data and responses and, (ii) Second, the researchers used Multiple Regression Analysis to assess the proposed research hypotheses. According to (Klienbaum et al., 2017), it is a powerful tool to examine the predicted research postulations. Further, it can also help the researchers to highlight the dynamic mechanisms by indicating which variables are more significantly linked with it.

5.1 Hypothesis Testing:
As the current study has one independent and several dependent variables, Multiple Regression was the most suitable technique for testing the proposed relationship (Uyanık & Güler, 2013). To represent the obtained results, **Table 3** below highlights the R-square, *P*-value, t-value, and the status of the research hypotheses. Thus, empirical data significantly supports **H1, H2, H3** and **H4** (β=.479, p=.005), (β=.518, p= .000), (β= .634, p=.002) (β= .862, p=.000) respectively.

Table 3: Multiple Regression Analysis to Test the Study Hypotheses

H	Relationship	β	*t*-value	*P*-value	Direction	Decision
H1	Knowledge sharing > Perceived Ease of Use & Perceived Usefulness	.479	5.072	.005	Positive**	Supported
H2	Communication facility > Perceived Ease of Use & Perceived Usefulness	.518	8.015	.000	Positive***	Supported
H3	Motivation & Usage > Perceived Ease of Use & Perceived Usefulness	.634	7.051	.002	Positive***	Supported
H4	Technology acceptance > Perceived Ease of Use & Perceived Usefulness	.862	15.870	.000	Positive***	Supported

The results revealed a strong significant relationship between knowledge sharing, communication facility, motivation and usage, and eLearning acceptance among instructors in Rawalpindi and Pakistan. These results are highly consistent with the study conducted by(Angela et al., 2018) as they found a strong positive relationship between knowledge sharing, communication availability, motivation & usage, eLearning acceptance, perceived ease of usage, and perceived usefulness. According to the researchers, eLearning is highly competitive and, sometimes, a better substitute for traditional learning methods. Due to the availability and ease of access, both students and teachers do not hesitate to adopt eLearning for educational and communication purposes. As eLearning integration, adoption, and acceptanceprimarily depend on various social, psychological, and attitudinal factors, and these factors are the determinants of technology acceptance. Especially today, when communication, education, entertainment, and information highly rely on web-based systems, both instructors and students prefer eLearning to continue their educational journey (Vululleh, 2018).As noted by (Queiroz, 2020), the idea both students and instructors should adopt technology is not new. To cope with emergencies, technology integration and usage bring fruitful outcomes in this regard, its teachers'' responsibility to embrace technology as an impotent means of learning.

Especially during theCovid-19 outbreak,when the local government declared an immediate closure of educational institutions (Khalid & Ali, 2020), eLearning is widely facilitating the students learning process (Habes, Salloum, et al., 2020)**.** According to (United Nations, 2020),the Covid-19 crisis is creating several challenges for the educational system worldwide. Due to the closure of schools, colleges, and universities, there are minimal opportunities for the teachers and students to continue the educational process. These educational barriers arealso creating several concerns for the upcoming generation as the provision of education can even hinder by any endemics in the future. Due to the closure of educational institutions, more than two billion students are suffering globally; however, closing institutions was an effective strategy to mitigate the transmission of Covid-19 among children and adolescents (United Nations, 2020).
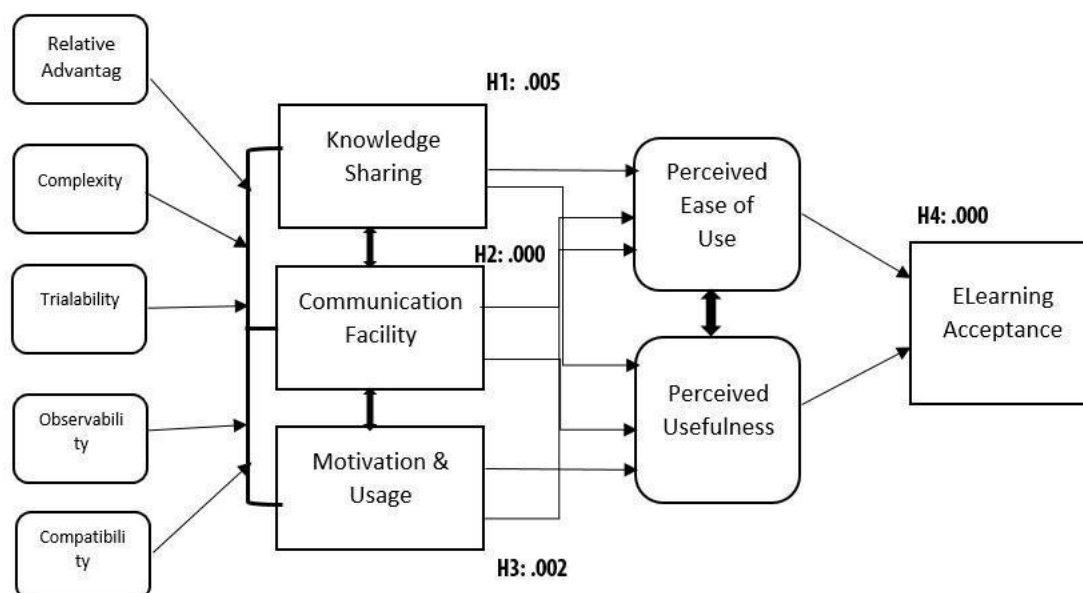
To mitigate the educational challenges during the Covid-19 outbreak, rush to distance and online education seemed the only way. Both developed and developing countries harnessed all the possible means to continue the educational process through technology. Governments digitized the educational environment, and instructors adopted eLearning to deliver existing course content and develop new courses if needed (UNESCO, 2020). Despite many developing countries confronted with several challenges regarding sustainable web-based learning technology, effective policies and strategies mainly helped in capacity building. Today, remote learning is facilitating both teachers and students, opening new dimensions to remove any potential educational obstacle shortly(United Nations, 2020).

Especially, Pakistan is a developing country, where the educational system highly relies upon traditional classroom learning system (I. Ahmad et al., 2014) Covid-19 adversely affected the formal learning environment(Khalid & Ali, 2020). Traditional learning patterns, limited technological accessibility, and less technology awareness among teachers, also raised many concerns for the education system in Pakistan (Adnan, 2020).Similarly, only 11% of educational institutions have an eLearning system, with only 68% of students having the financial support to integrate eLearning. School going children, as compared to college and university students, remain indifferent about eLearning, which shows a serious concern towards technology adoption (International Rescue Committee, 2020). Regarding eLearning in higher education, universities in Pakistan lack any standardized Learning Management System to cope with the current challenges. However, influential policies and better administrative systems helped the Federal Ministry of Education, Pakistan, to deal with enormousproblems. In this regard,to counteract against educational challenges during the lockdown, the Ministry of Education, Pakistan, took different available options under consideration. However, adopting eLearning during the lockdown was the most effective and available option (GOP, 2020). For this purpose, all the secondary, higher secondary, and higher educational institutions introduced an online Learning Management System to continue educational activities.

Similarly, the Government of Pakistan also introduced educational content to broadcast on television channels for an unhindered educational process (OCHA, 2020). In this context, an improved, flexible, and accessible learning environment needs the integration of all the modern techniques. These techniques not only ease the learning process but also help to keep pace with the contemporary trends in education and learning(Smedley, 2016). For this purpose, eLearning provides flexible and sufficient means of communication and education opportunities, Analyzing the users' eLearning adoption explains the dynamics of eLearning acceptance (Al-Shboul, 2013). As an adequate amount of research in educational witness a secure link between the Technology Acceptance Model and eLearning acceptance, it is notable that eLearning has become highly attractive. Due to this reason, many studies emphasized the adoption and integration of technology in education (Granić & Marangunić, 2019). (Salloum, Al-Emra, et al., 2019) also revealed the same outcomes where the Technology Acceptance Model determined the patterns of eLearning acceptance.

(Amer et al., 2013) also affirmed this phenomenon as they argued that the technological transformation of the educational system allowed unhindered access to learning opportunities. Despite many challenges also exist, eLearning offers several benefits that ensure its acceptance. Likewise, many studies also witnessed that eLearning does not base on mere ease of communication and interaction. It also contains relative advantage, observability, complexity, trialability, and compatibility that distinguish it from the traditional classroom

learning environment(Chaipoopirutana et al., 2009). The Diffusion of Innovation theory extensively describes these qualities as underlying determinants of accepting an innovation (Aizstrauta et al., 2015). Both the Technology Acceptance Model and the Diffusion of Innovation theory support eLearning as a process regulated by precise dynamic mechanisms,(Alghizzawi, Ghani, et al., 2018)As noted by (Y. H. Lee et al., 2011), the Technology Acceptance Model and Diffusion of Innovation theory are similar to assess the technology adoption. Many concepts attributed to technology adoption equally exist both in TAM and the Diffusion of Innovation theory. Thus utilizing both these conceptual backgrounds provide seven more robust support to technology acceptance as previous studies applied both to determine the technology acceptance in general (Wu et al., 2006).

6. Conclusion:

During to Covid-19 outbreak, there is an increased dependency on web-based technology. People all around the world rely heavily on online platforms to communicate, entertain, and to gather information. Similarly, the educational system is also relying on online technology to pursue scholarly activities. Although, unlike the developed countries, Pakistan has a comparatively weak technological system and technology acceptance is slow, Ministry of Education highly emphasize on eLearning as a part of education (Shahid and Ahmad 2018;GOP 2020)However, teachers can play a fundamental role in persuading the students for eLearning integration and adoption during the Covid-19 pandemic. At this point, it is essential to evaluate teachers' opinions regarding technology acceptance and its potential impacts on students'' academic performance (Abbasi et al., 2020). The current study provided instructors' ideas regarding technology acceptance, particularly during the current lockdown situation(Al-Shibly et al., 2019; Muhaisen et al., 2020)Accompanied by the technology Acceptance Model and Diffusion of Innovation Theory, this research provides valuable insights regarding the technology acceptance determinant during the Covid-19 outbreak. Due to specific limitations, the researchers could not gather a large sample of respondents; the study is still of greater relevance. Therefore, the researchers conclude technology as an essential substitute for formal education, especially during emergencies like Covid-19. By keeping the importance of eLearning during the current scenario (United Nations, 2020), the study also suggests effective policies to sustain technology adoption in Pakistan

Study Contributions:

This study investigated the eLearning acceptance, especially during Covid-19, as a substituteforthe formal classroom learning environment in Pakistan. Although there are any studies investigating students' perceptions regarding technology acceptance (Adnan, 2020; Alghizzawi, Salloum, et al., 2018; Amer et al., 2013; Habes, Salloum, et al., 2020; Smedley, 2016), rarely any research scrutinized the teachers' perception regarding eLearning, particularly in Pakistan. However, the weak eLearning system in Pakistan is a significant obstacle to keep pace with the growing educational challenges. Likewise, Pakistan needsmore robust strategies and infrastructure to continue educational activities even during the crisis in the future.

Limitations & Recommendations:

The researchers used data obtained by the continence sampling method, which is the main limitation of this study. Besides, a brief sample is another major limitation that further narrows down its scope. However, the researchers took every step to bring clarity in the methodology and data analysis process. Thus, the researchers recommend more studies concerning technology acceptance for educational purposes in Pakistan to cope with the existing challenges regarding eLearning adoption and integration.

References

Aamir Latif, & Islamuddin Sajid. (2020). *Pakistan closes schools, universities over coronavirus*.

Abbas, J., Aman, J., Nurunnabi, M., & Bano, S. (2019). The impact of social media on learning behavior for sustainable education: Evidence of students from selected universities in Pakistan. *Sustainability (Switzerland)*, *11*(6). https://doi.org/10.3390/su11061683

Abbasi, S., Ayoob, T., Malik, A., & Memon, S. I. (2020). Perceptions of students regarding e-learning during covid-19 at a private medical college. *Pakistan Journal of Medical Sciences*, *36*(COVID19-S4), S57–S61. https://doi.org/10.12669/pjms.36.COVID19-S4.2766

Abdul, J., Ansari, N., & Khan, N. A. (2020). *Exploring the role of social media in collaborative learning the new domain of learning*. *7*.

Adnan, M. (2020). Online learning amid the COVID-19 pandemic: Students perspectives. *Journal of Pedagogical Research*, *1*(2), 45–51. https://doi.org/10.33902/jpsp.2020261309

Ahmad, I., Ur Rehman, K., Ali, A., Khan, I., & Khan, F. A. (2014). Critical Analysis of the Problems of Education in Pakistan: Possible Solutions. *International Journal of Evaluation and Research in Education (IJERE)*, *3*(2), 79–84. https://doi.org/10.11591/ijere.v3i2.1805

Ahmad, S. (2020). A Review of COVID-19 (Coronavirus Disease-2019) Diagnosis, Treatments and Prevention.

Eurasian Journal of Medicine and Oncology, *4*(2), 116–125. https://doi.org/10.14744/ejmo.2020.90853

Aizstrauta, D., Ginters, E., & Eroles, M. A. P. (2015). Applying theory of diffusion of innovations to evaluate technology acceptance and sustainability. *Procedia Computer Science*, *43*(C), 69–77. https://doi.org/10.1016/j.procs.2014.12.010

Al-Shboul, M. (2013). The level of E-learning integration at the University of Jordan: Challenges and opportunities. *International Education Studies*, *6*(4), 93–113. https://doi.org/10.5539/ies.v6n4p93

Al-Shibly, M. S., Alghizzawi, M., Habes, M., & Salloum, S. A. (2019). The Impact of De-marketing in Reducing Jordanian Youth Consumption of Energy Drinks. *International Conference on Advanced Intelligent Systems and Informatics*, 427–437.

Aldowah, H., Al-Samarraie, H., & Ghazal, S. (2019). How Course, Contextual, and Technological Challenges are Associated with Instructors' Individual Challenges to Successfully Implement E-Learning: A Developing Country Perspective. *IEEE Access*, *7*, 48792–48806. https://doi.org/10.1109/ACCESS.2019.2910148

Alghizzawi, M., Ghani, M. A., Som, A. P. M., Ahmad, M. F., Amin, A., Bakar, N. A., Salloum, S. A., & Habes, M. (2018). The Impact of Smartphone Adoption on Marketing Therapeutic Tourist Sites in Jordan. *International Journal of Engineering & Technology*, *7*(4.34), 91–96.

Alghizzawi, M., Habes, M., & Salloum, S. A. (2019). The Relationship Between Digital Media and Marketing Medical Tourism Destinations in Jordan: Facebook Perspective. *International Conference on Advanced Intelligent Systems and Informatics*, 438–448.

Alghizzawi, M., Salloum, S. A., & Habes, M. (2018). The role of social media in tourism marketing in Jordan. *International Journal of Information Technology and Language Studies*, *2*(3).

Alhawamdeh, A. K., Alghizzawi, M., & Habes, M. (2020). *The Relationship Between Media Marketing Advertising and Encouraging Jordanian Women to Conduct Early Detection of Breast Cancer The Relationship Between Media Marketing Advertising and Encouraging Jordanian Women to Conduct Early Detection of Breast Canc*. *May*. https://doi.org/10.7176/EJBM/12-12-11

Alhumaid, K. F. (2014). *Perspectives and Usage of Technology of Arabic Language Teachers in the United Arab Emirates*. University of Kansas.

Alhumaid, K. (2020). The use of mobile technology for teaching and learning. *International Journal of Education*, *5*(1), 1–18.

Alhumaid, Khadija. (2019). Feminist Perspectives on Education and Pedagogy: A Meta-Synthetic Insight into the Thought of Four American Philosophers. *Academic Journal of Interdisciplinary Studies*, *8*(3), 31.

Ali, S. (2019). *Social Media Usage among Teenage Girls in Rawalpindi and Islamabad*. *January 2018*, 0–9.

Amer, A.-A., Ahmad, A.-A., & Jo, S. (2013). Exploring Students Acceptance of E-learning Using Technology Acceptance Model in Jordanian Universities. *International Journal of Education and Development Using Information and Communication Technology*, *9*(2), 4–18.

Angela, Sylvia, C., Handoko, & Abdurachman, E. (2018). E-learning acceptance analysis using technology acceptance model (Tam) (case study: Stmik mikroskil). *Journal of Theoretical and Applied Information Technology*, *96*(19), 6292–6305. https://doi.org/10.5281/zenodo.3256381

Aristovnik, A., Keržič, D., Tomaževič, N., & Umek, L. (2016). Determining factors of students' perceived usefulness of e-learning in higher education. *Proceedings of the International Conference on E-Learning, EL 2016 - Part of the Multi Conference on Computer Science and Information Systems 2016*, 3–10.

Aslam, F. (2020). COVID-19 and Importance of Social Distancing. *Preprints*, *April*. https://doi.org/10.20944/preprints202004.0078.v1

Bakhuisen, N. (2012). *Knowledge Sharing using Social Media in the Workplace*. VU University Amsterdam.

Balubaid, M. A. (2013). Using Web 2.0 Technology to Enhance Knowledge Sharing in an Academic Department. *Procedia - Social and Behavioral Sciences*, *102*(Ifee 2012), 406–420. https://doi.org/10.1016/j.sbspro.2013.10.756

Bauer, P., Kolb, C., & Bastian, J. (2014). Increasing Access through Mobile Learning. In *Proceedings of the 16th International Conference Mobile Learning 2020, ML 2020*. https://doi.org/10.4018/978-1-61350-080-4.ch015

Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers and Education*, *58*(2), 843–855. https://doi.org/10.1016/j.compedu.2011.10.010

Buchanan, T., Sainter, P., & Saunders, G. (2013). Factors affecting faculty use of learning technologies: Implications for models of technology adoption. *Journal of Computing in Higher Education*, *25*(1), 1–11. https://doi.org/10.1007/s12528-013-9066-6

Chaipoopirutana, S., Combs, H., Chatchawanwan, Y., & Vikrant, V. (2009). Diffusion of innovation in Asia : A study of Internet banking in Thailand and India. *Innovative Marketing*, *5*(4), 27–31.

Chaudhry, R. M., Hanif, A., Chaudhary, M., Ii, S. M., Ashraf, T., Gilani, S. A., & Kashif, M. (2020). *Coronavirus Disease 2019 (COVID-19): Forecast of an Emerging Urgency in Pakistan Data*. *2019*(5).

https://doi.org/10.7759/cureus.8346

Chawinga, W. D. (2017). Taking social media to a university classroom: teaching and learning using Twitter and blogs. *International Journal of Educational Technology in Higher Education*, *14*(1). https://doi.org/10.1186/s41239-017-0041-6

Chen, H., & Tseng, H. (2012). Factors that influence acceptance of web-based e-learning systems for the in-service education of junior high school teachers in Taiwan. *Evaluation and Program Planning*, *35*(3), 398–406. https://doi.org/10.1016/j.evalprogplan.2011.11.007

De Vos, J. (2020). The effect of COVID-19 and subsequent social distancing on travel behavior. *Transportation Research Interdisciplinary Perspectives*, *5*, 100121. https://doi.org/10.1016/j.trip.2020.100121

Dearing, J. W., & Cox, J. G. (2018). Diffusion of innovations theory, principles, and practice. *Health Affairs*, *37*(2), 183–190. https://doi.org/10.1377/hlthaff.2017.1104

Derani, N. E. S., & Naidu, P. (2016). The Impact of Utilizing Social Media as a Communication Platform during a Crisis within the Oil Industry. *Procedia Economics and Finance*, *35*(October 2015), 650–658. https://doi.org/10.1016/s2212-5671(16)00080-0

Di Gennaro, F., Pizzol, D., Marotta, C., Antunes, M., Racalbuto, V., Veronese, N., & Smith, L. (2020). Coronavirus diseases (COVID-19) current status and future perspectives: A narrative review. *International Journal of Environmental Research and Public Health*, *17*(8). https://doi.org/10.3390/ijerph17082690

Dickinson, A. (2017). Communicating with the online student: The impact of E-Mail tone on student performance and teacher evaluations. *Journal of Educators Online*, *14*(2). https://doi.org/10.9743/jeo.2017.14.2.5

Dintoe, S. (2018). *Technology innovation diffusion at the University of Botswana : A comparative literature survey Seitebaleng Susan Dintoe Memorial University of Newfoundland , Canada*.

Elkaseh, A. M., Wong, K. W., & Fung, C. C. (2016). *The Acceptance of E-learning as a Tool for Teaching and Learning in Libyan Higher*. *September*.

EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL. (2020). *Considerations relating to social distancing measures in response to the COVID-19 epidemic*. *March*, 1–10.

Figueiredo, A. M. De, Codina, A. D., Marculino, D. figueirredo, M, S., & A Leon, C. (2020). Impact of lockdown on COVID-19 incidence and mortality in China: an interrupted time series study. *Bull World Health Organ*, *April*, 1–18. https://doi.org/http://dx.doi.org/10.2471/BLT.20.256701

Flavell, H., Harris, C., Price, C., Logan, E., & Peterson, S. (2019). Empowering academics to be adaptive with eLearning technologies: An exploratory case study. *Australasian Journal of Educational Technology*, *35*(1). https://doi.org/10.14742/ajet.2990

Frey, F. (2017). SPSS (Software) . *The International Encyclopedia of Communication Research Methods*, *November 2016*, 1–2. https://doi.org/10.1002/9781118901731.iecrm0237

Froment, F., García González, A. J., & Bohórquez, M. R. (2017). The use of social networks as a communication tool between teachers and students: A literature review. *Turkish Online Journal of Educational Technology*, *16*(4), 126–144.

Gaál, Z., Szabó, L., Obermayer-Kovács, N., & Csepregi, N. (2015). *Exploring the Role of Social Media in Knowledge Sharing*. https://doi.org/10.1145/3047273.3047374

GOP. (2020). *PAKISTAN NATIONAL EDUCATION RESPONSE AND RESILIENCE PLAN (K-12) for. May*, 1–24.

Government of Pakistan. (2020). *COVID-19 Health Advisory Platform by Ministry of National Health Services Regulations and Coordination*.

Granić, A., & Marangunić, N. (2019). Technology acceptance model in educational context: A systematic literature review. *British Journal of Educational Technology*, *50*(5), 2572–2593. https://doi.org/10.1111/bjet.12864

Habes, M. (2019). The influence of personal motivation on using social TV: A Uses and Gratifications Approach. *International Journal of Information Technology and Language Studies*, *3*(1).

Habes, M., Alghizzawi, M., Ali, S., SalihAlnaser, A., & Salloum, S. A. (2020). The Relation among Marketing ads, via Digital Media and mitigate (COVID-19) pandemic in Jordan. *International Journal of Advanced Scienc*, *29*(7), 2326–12348.

Habes, M., Alghizzawi, M., Salloum, S. A., & Mhamdi, C. (2020). Effects of Facebook Personal News Sharing on Building Social Capital in Jordanian Universities. In *Recent Advances in Intelligent Systems and Smart Applications* (pp. 653–670). Springer.

Habes, M., Salloum, S. A., Alghizzawi, M., & Alshibly, M. S. (2018). The role of modern media technology in improving collaborative learning of students in Jordanian universities. *International Journal of Information Technology and Language Studies*, *2*(3).

Habes, M., Salloum, S. A., Alghizzawi, M., & Mhamdi, C. (2020). *Advances in Intelligent Systems and Computing 1058 Proceedings of the International Conference on Advanced Intelligent Systems and*

Informatics. https://doi.org/10.1007/978-3-030-31129-2

Habes, M., Salloum, S. A., Alghizzawi, M., & Mhamdi, C. (2019). The Relation Between Social Media and Students' Academic Performance in Jordan: YouTube Perspective. *International Conference on Advanced Intelligent Systems and Informatics*, 382–392.

Hart, C. M. D., Berger, D., Jacob, B., Loeb, S., & Hill, M. (2019). Online Learning, Offline Outcomes: Online Course Taking and High School Student Performance. *AERA Open*, *5*(1), 233285841983285. https://doi.org/10.1177/2332858419832852

Hassan, M., Kazmi, S. S. A. S., & Padlee, S. F. (2019). Technology acceptance model (TAM) and dynamics of online purchase adaptability. *International Journal of Recent Technology and Engineering*, *8*(1), 390–402.

Hayat, K., Rosenthal, M., Xu, S., Arshed, M., Li, P., Zhai, P., Desalegn, G. K., & Fang, Y. (2020). View of Pakistani residents toward coronavirus disease (COVID-19) during a rapid outbreak: A rapid online survey. *International Journal of Environmental Research and Public Health*, *17*(10), 1–10. https://doi.org/10.3390/ijerph17103347

Huang, L., Clarke, A., Heldsinger, N., & Tian, W. (2019). The communication role of social media in social marketing: a study of the community sustainability knowledge dissemination on LinkedIn and Twitter. *Journal of Marketing Analytics*, *7*(2), 64–75. https://doi.org/10.1057/s41270-019-00053-8

International Labour Organization. (2020). *ILO Sectoral Brief: COVID-19 and the Education Sector*. *March*, 1–8.

International Rescue Committee, P. (2020). *COVID-19 Rapid Need Assessment*.

Khalid, A., & Ali, S. (2020). COVID-19 and its Challenges for Healthcare System in Pakistan COVID-19 and its Challenges for the Healthcare System in Pakistan. *Asian Bioehtics Review*, *August*. https://doi.org/10.1007/s41649-020-00139-x

Klienbaum, D. G., Kleinbaum, D., Nizam, A., & Muller, K. E. (2017). Multiple regression analysis: general considerations. In *Applied Regression Analysis and Multivariable Methods* (pp. 114–138). SAGE Publications.

Latifah, A. L., & Thirumeni, T. S. (2016). Students' learning outcomes in online courses: continual quality improvement. *Commonwealth of Learning*, *Pan-Common*(2010).

Lavrakas, P. (2012). Encyclopedia of Survey Research Methods. In *Encyclopedia of Survey Research Methods*. Sage Publications, Inc. https://doi.org/10.4135/9781412963947

Lee, Y. H., Hsieh, Y. C., & Hsu, C. N. (2011). Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems. *Educational Technology and Society*, *14*(4), 124–137.

Lee, Y., Hsieh, Y., & Hsu, C. (2015). International Forum of Educational Technology & Society Adding Innovation Diffusion Theory to the Technology Acceptance Model : Supporting Employees ' Intentions to use E-Learning Systems. *International Forum of Educational Technology & Society*, *14*(4).

Manzoor, I. (2020). Pakistan and the COVID-19 challenges. *Journal of Fatima Jinnah Medical University*, *14*(1), 1–2. https://doi.org/10.37018/dsmy7203

Mayende, G., Prinz, A., & Isabwe, G. M. N. (2017). Improving communication in online learning systems. *CSEDU 2017 - Proceedings of the 9th International Conference on Computer Supported Education*, *1*(December), 300–307. https://doi.org/10.5220/0006311103000307

Muhaisen, O. Al. (2020). An Empirical Investigation the Use of Information , Communication Technologies to English Language Acquisition : A Case Study from the Jordan TECHNOLOGIES TO ENGLISH LANGUAGE ACQUISITION : A CASE STUDY FROM. *International Journal of Innovations in Engineering and Science*, *7*(5), 261–269.

Muhaisen, O. Al, Habes, M., & Alghizzawi, M. (2020). *An Empirical Investigation the Use of Information , Communication Technologies to English Language Acquisition : A Case Study from the Jordan TECHNOLOGIES TO ENGLISH LANGUAGE ACQUISITION : A CASE STUDY FROM*. *May*.

Munoz, L. R., Pellegrini-Lafont, C., & Cramer, E. (2014). Using Social Media in Teacher Preparation Programs: Twitter as a Means to Create Social Presence. *Perspectives on Urban Education*, *11*(2), 57–69.

NIH. (2020). *National Institute of Health*.

OCHA. (2020). *Humanitarian Response Plan for Covid-19 Pandemic 2020*.

Özçakir, F., Erkoç, M. F., & Özçakir, Ş. (2015). The use of social media in education: A review of recent research. *Internatianal Conference The Future of Education Edition 5*, *June*, 35–55. https://doi.org/10.13140/RG.2.1.1310.7924

Priyanto, P., Sofyan, H., & Surjono, H. D. (2017). The determinats of e-learning usage by teachers of vocational high schools in the Yogyakarta Special Region. *Jurnal Pendidikan Vokasi*, *7*(1), 1. https://doi.org/10.21831/jpv.v7i1.12770

Punnoose, A. C. (2012). Determinants of intention to use eLearning based on the technology acceptance model. *Journal of Information Technology Education:Research*, *11*(1), 301–337. https://doi.org/10.28945/1744

Queiroz, V. (2020). *COVID-19 and the challenges in Education*. *March*.

Ramirez-Anormaliza, R., Sabaté Garriga, F., & Llinàs-Audet, X. (2016). the Acceptance and Use of the E-Learning Systems Among the University Teachers in Ecuador. *EDULEARN16 Proceedings*, *1*(July), 3666–3674. https://doi.org/10.21125/edulearn.2016.1836

Rana, W., Mukhtar, S., & Mukhtar, S. (2020). COVID-19 in Pakistan: Current Status and Challenges. *Journal of Clinical Medicine of Kazakhstan*, *3*(57), 48–52. https://doi.org/10.23950/1812-2892-JCMK-00766 Robinson, L. (2009). Understanding Diffusion of Innovations: A summary of Diffusion of Innovations. *Energy Policy*, 1–10.

Rubi, G., Malik, I., & Javaid, Z. (2020). *COVID-19 in Pakistan*. *July*, 23–25.

Saïd Assar. (2019). *Information and Communications Technology (ICT) and Education*. 66–71.

Saini, C., & Abraham, J. (2015). *Using Social Media for educational purposes*. *February 2015*, 484–489.

Salloum, S. A., Al-Emra, M., Habes, Mo., & Alghizzawi, M. (2019). *Understanding the Impact of Social Media Practices on E-Learning Systems Acceptance*. https://doi.org/10.1007/978-3-030-31129-2

Salloum, S. A., Al-Emran, M., Habes, M., Alghizzawi, M., Ghani, M. A., & Shaalan, K. (2019). Understanding the Impact of Social Media Practices on E-Learning Systems Acceptance. *International Conference on Advanced Intelligent Systems and Informatics*, 360–369.

Saqlain, M., Munir, M. M., Ahmed, A., Tahir, A. H., & Kamran, S. (2020). Is Pakistan prepared to tackle the coronavirus epidemic? *Drugs and Therapy Perspectives*, *36*(5), 213–214. https://doi.org/10.1007/s40267-020-00721-1

Sarwar, S., Waheed, R., Sarwar, S., & Khan, A. (2020). COVID-19 challenges to Pakistan: Is GIS analysis useful to draw solutions? *Science of the Total Environment*, *730*, 139089. https://doi.org/10.1016/j.scitotenv.2020.139089

Scott, S., & McGuire, J. (2017). Using Diffusion of Innovation Theory to Promote Universally Designed College Instruction. *International Journal of Teaching and Learning in Higher Education*, *29*(1), 119–128.

Shahid, M. K., & Ahmad, S. F. (2018). *The Development of Technology Acceptance Model for Adoption of Mobile Banking in Pakistan*. *May*.

Shane-Simpson, C., Manago, A., Gaggi, N., & Gillespie-Lynch, K. (2018). Why do college students prefer Facebook, Twitter, or Instagram? Site affordances, tensions between privacy and self-expression, and implications for social capital. *Computers in Human Behavior*, *86*, 276–288. https://doi.org/10.1016/j.chb.2018.04.041

Shiau, S. J. H., Huang, C. Y., Yang, C. L., & Juang, J. N. (2018). A derivation of factors influencing the innovation diffusion of the OpenStreetMap in STEM education. *Sustainability (Switzerland)*, *10*(10), 1–29. https://doi.org/10.3390/su10103447

Smedley, J. (2016). *Exploring students acceptance of e-learning using Technology Acceptance Model in Jordanian universities Exploring students acceptance of e-learning using Technology Acceptance Model in Jordanian universities Amer Al- Adwan Applied Science University , Jor*. April 2013.

Suebsom, K., & Dahalin, Z. (2014). *Knowledge sharing through Social Media for Higher Education Classroom*. *August*, 12–15.

Sultan Alam. (2020). *COVID 19: A Paradigm Shift in Education – PAMIR TIMES*.

Tabak, F., & Nguyen, N. T. (2013). Technology Acceptance and Performance in Online Learning Environments: Impact of Self-Regulation. *Journal of Online Learning and Teaching*, *9*(1), 116–130.

Talpau, A. (2014). Social Media – A New Way of Communication. *Bulletin of the Transilvania University of Braşov Series V: Economic Sciences*, *7*(56/2), 45–52.

Teo, T. (2011). Modeling the determinants of pre-service teachers' perceived usefulness of e-learning. *Campus-Wide Information Systems*, *28*(2), 124–140. https://doi.org/10.1108/10650741111117824

Trebor Scholz, R. (2013). Learning Through Digital Media: Experiments in Technology and Pedagogy. *IDC*, 325.

UNESCO. (2020a). *School closures caused by Coronavirus (Covid-19)*.

UNESCO. (2020b). *The Futures of Education after COVID-19 Regional Dialogue*.

UNHCR. (2020). *SUPPORTING CONTINUED ACCESS TO EDUCATION DURING COVID-19 Emerging Promising Practices*.

United Nations. (2020). *Policy Brief : Education during COVID-19 and beyond* (Issue August).

Uyanık, G. K., & Güler, N. (2013). A Study on Multiple Linear Regression Analysis. *Procedia - Social and Behavioral Sciences*, *106*, 234–240. https://doi.org/10.1016/j.sbspro.2013.12.027

Vululleh, P. (2018). Determinants of students' e-learning acceptance in developing countries: An approach based on Structural Equation Modeling (SEM). *International Journal of Education and Development Using Information and Communication Technology*, *14*(1), 141–151.

Wan Othman, W. R., Apandi, Z. F. M., & Ngah, N. H. (2016). The uses of social media on student's communication and self concepts among TATIUC students. *Indian Journal of Science and Technology*, *9*(17). https://doi.org/10.17485/ijst/2016/v9i17/88730

Waris, A., Atta, U. K., Ali, M., Asmat, A., & Baset, A. (2020). COVID-19 outbreak: current scenario of Pakistan. *New Microbes and New Infections*, *35*(20), 100681. https://doi.org/10.1016/j.nmni.2020.100681

WHO. (2020a). Coronavirus disease 2019 (67). *World Health Organization*, *2019*(March), 2633. https://doi.org/10.1001/jama.2020.2633

WHO. (2020b). Novel Coronavirus (2019-nCoV) Situation Report - 1. *WHO Bulletin*, *JANUARY*, 1–7.

Wu, J., Tsai, R. ay J., Chen, C. C., & Wu, Y. (2006). An Integrative Model to Predict the Continuance Use of Electronic Learning Systems : Hints for Teaching. *International Journal on E-Learning*, *5*(2), 287–302.

Yilmaz, O. (2016). E-Learning: Students Input for Using Mobile Devices in Science Instructional Settings. *Journal of Education and Learning*, *5*(3), 182. https://doi.org/10.5539/jel.v5n3p182

Yuen, A. H. K., & Ma, W. W. K. (2008). *Asia-Pacific Journal of Teacher Exploring teacher acceptance of e - learning technology. October 2014*, 37–41. https://doi.org/10.1080/13598660802232779

Zachos, G., Paraskevopoulou-Kollia, E. A., & Anagnostopoulos, I. (2018). Social media use in higher education: A review. *Education Sciences*, *8*(4). https://doi.org/10.3390/educsci8040194

Zhang, X., Yu, P., Yan, J., & Ton A M Spil, I. (2015). Using diffusion of innovation theory to understand the factors impacting patient acceptance and use of consumer e-health innovations: A case study in a primary care clinic Healthcare needs and demand. *BMC Health Services Research*, *15*(1), 1–15. https://doi.org/10.1186/s12913-015-0726-2

.

Author Information

Khadija Alhumaid
College of Education, Zayed University, Abu Dhabi, UAE & Allama Iqbal Open University Islamabad, Pakistan

Sana Ali
National University of Modern Language Islamabad, Pakistan

Anbreen Waheed
International Islamic University Islamabad, Pakistan

Erum Zahid
International Islamic University Islamabad, Pakistan

Mohammed Habes
Faculty of Mass Communication, Yarmouk University, Jourdan