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RESEARCH PAPER

Dark Clouds with Silver Linings: Use of Mobile Technology during COVID-19 among University Students

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PAPER INFO	ABSTRACT
	This study aims to explore the academic and leisure use of mobile technologies among students during the COVID-19 pandemic. It also identified the challenges they faced while using mobile technologies. It was a quantitative study based on a questionnaire survey. An online questionnaire was used to collect the data from university students to understand their mobile technologies' use during COVID-19 epidemic. The data depicted that university students used mobile technologies both for leisure and academic purposes to get their everyday information. They used it to share their academic documents, to keep in touch with teachers and fellows, and to save documents. It was noted that they use mobile technologies to engage in academic activities as well as to keep in touch with their loved ones during the period of confinement. The majority of them were users of smartphones. However, they were facing challenges while using mobile technologies such as the high cost of the devices, limited storage facilities, compatibility issues, data insecurity, and low battery life of the devices. The study would help understand the use of mobile technologies in relieving students from stress through their use for leisure purposes. Most importantly, it would articulate the effectiveness of online learning in comparison to traditional learning specifically in the time of confinement.

Introduction

Mobile devices were widely used among students due to their convenience, ease of use, portability, and versatility. These devices became an integral part of students' life for multiple reasons including entertainment, acquisition of information, and even access to educational materials online as well as in offline mode. Portability is a great feature of mobile technologies and these devices consisted of tablets, smartphones, smartwatches, and laptops (Chen et al., 2013). Mobile technologies were the essential technological tools that could help students and teachers to continue their educational processes in circumstances caused by the pandemic (Naciri, et al., 2020). Lyengar et al. (2020) depicted that mobile technology tools or devices were the only means of communication for students during Covid-19 especially in the time of confinement. Mobile technologies are considered effective to maintain social distancing and these became an important part of every person's life to connect to the outer world.

Recent research studies confirmed an increase in the use of smartphones during the Covid-19 due to multiple reasons including anxiety, fear, social isolation and to perform various personal and academic activities (Chopdar, Paul, & Prodanova, 2021; Kong et al.,2020). Hodes and Thomas (2021) verified that there is a substantial increase in screen viewing time and addiction to smartphones among the youth.

Mobile technologies were proved beneficial to the general public during this critical situation when everyone was locked in the four walls of their home. Because it was the most convenient way to connect and communicate with the family members. It helped every individual of varied fields of life in the critical situation of Covid-19. The businessperson took their business from traditional to online mode and promoted and delivered the products with the help of these technologies. Health care systems across the world were backed by mobile technologies and faced many challenges during the pandemic. Lyengar (2020) demonstrated that mobile technologies have been playing a key role in delivering health care services. Mobile technology is considered an alternative to the traditional healthcare system soon. The educational process was also shifted from traditional to digital with the extensive use of mobile technologies.

Mobile technology proved beneficial for the students as to stay updated and connected with their class fellows and teachers. These mobile technology tools consume most of the time for entertainment and fun by playing games, using different apps and browsing for information to stay updated, and watching fun videos to refresh our minds. The technologies also supported the students' academic purposes to make assignments, to save electronic documents and to send and receive emails, to take online lectures, and to help in making presentations. In case of emergency, people can connect to anyone and call for help and can stay updated on the latest news with just one click of mobile technology tools.

A systematic review study highlighted the benefits as well challenges of learning through mobile technologies during the Covid-19 situation. Benefits included the continuation of the education process, ease of use, flexibility, mobility, and cost-effective. Whereas there were several challenges including availability and access issues, language barriers, security and privacy concerns, content problems, non-ICT, and aged educators, and lack of adaption and real-time attraction among students and teachers (Saikat, Dhillon, Wan Ahmad, & Jamaluddin, 2021). Alhumaid, Habesand and Salloum (2021) confirmed the benefits of mobile learning as ease of use, attitude, subjective norm, attitude, and students' satisfaction.

Pakistan chose the option of smart lockdown instead of complete lockdown because 25% of the population lives below the poverty line. The roads were open only for the transportation of goods and food items. The government introduced the tiger force which distributed food items to the poor families who cannot earn during lockdown especially the labourers. The government approved the economic relief fund to help the poor. With the help of this program financial support, was provided to needy people during this critical situation. The government decided to close all the shopping malls, parks, and other visiting places to stop the virus from spreading. The regional motorways, except for private vehicles were shut down. The federal government and provincial governments took the measures with the help of each other. In the context of Pakistan, laptops were distributed through Prime Minister Laptop Scheme among secondary to postgraduate students. So, it was necessary to look into the academic and leisure use of mobile technologies among university students in the situation of Covid-19

There are several studies on the use of mobile technologies in different contexts either its learning or health. However, there are few studies on the use of mobile technologies for academic, leisure purposes during the pandemic. Zu et al. (2019) stated that in December 2019, an outburst of coronavirus 2 infections happened in the Wuhan and

spread rapidly in China and the outer world. The World Health Organization declared the public health emergency of international concern (a pandemic) on January 30, 2020.

This outbreak significantly disrupted the social, economic and educational setups of the entire world. Academicians had to transform their teaching and learning processes from traditional to online through mobile technologies.

Bhavya and Sambhav (2020) were outspoken about the role of mobile technologies in the critical situation of the pandemic in the support of the education system of the world through applications such as Zoom, Team and Google Meet, etc. The utilization of portable learning permits learning whenever, wherever, and anyplace. Portable Learning is an unavoidable option during COVID-19. Intawong, Olson and Chariyalertsak (2021) highlighted Covid-19 challenges and implementation of real-time mobile applications to cope up with these challenges in the context of Thailand. Verhagen et al. (2020) highlighted unpreparedness of low- and middle- income countries to manage their health emergency in pandemic and suggested communication through mobile technologies. Zaidi et al. (2021) explored adoption of mobile technologies for learning among Indian university students.

As this epidemic started in December 2019 and came to Pakistan in February 2020 so there is no big number of published literatures on this topic yet. Mumtaz, Saqulain, and Mumtaz (2021) indicated compromised education situation due to the interruption of the pandemic. This situation led to the implementation of reliable and cost-effective online systems to support the educational process. Adnan and Anwar (2020) demonstrated that Pakistani university students were uneasy to the compulsory online learning during the pandemic due to the internet connectivity issues, inability of face-to-face interaction and unavailability of traditional classroom socialization. Likely, Farooq, Rathore, and Mansoor (2020) highlighted challenges of online medical education in Pakistan and pointed out lack of faculty training, internet connectivity issues, lack of institutional support and students' engagement as daunting challenges of educational process during the Covid-19. However, no study explores the use of mobile technology in learning or for leisure purposes during the pandemic. Moreover, Lau et al. (2020) suggested further research to infer the reasons why students were less active in engaging with mobile technologies for academic use particularly to perform their academic tasks. Hence, there was a dire need to investigate use of mobile technologies for leisure as well as academic purposes among university students of Pakistan.

Literature Review

Mobile technologies proved to be wonderful tools to share, collaborate and learn multiple ideas among students and educators with the help of technology and the availability of the internet (Al-Emran, Elsherif, & Shaalan, 2016). Further, ownership of the electronic device and learning attitudes were found significant learning indicators among university students as who had both smartphones and tablets were more avid learners than others (Al-Emran, Elsherif, & Shaalan, 2016). Several studies reported a higher level of ownership of electronic devices among university students at Utah State University-owned smartphones followed by iPod touch, iPad, and e-book reader. the students preferred iPod touch, iPad, and e-book reader to access library electronic resources (Dresselhaus, & Shrode, 2012). Most of the medical students owned electronic devices i.e. smartphones, tablets, or both (Briz-Ponce, et. al., 2017). Similarly, 92.6% of four Canadian university students reported having at least one electronic device (Boruff, & Storie, 2014). Rahamat, Shah, Din, and Abd Aziz (2017) declared 91.5% of students owned electronic devices and many of these technologies were with 3G technologies.

Engagement, learning, and recreation could be assured through the use of mobile technologies among university students (Briz-Ponce, et. al., 2017; Lo, et. al., 2016; Martin, &

Ertzberger, 2013). But the variation of preferences towards specific devices was reported as students were more attracted towards iPads than computer-based technologies (Martin, & Ertzberger, 2013). Medical students were analyzed through Technology Acceptance Model and a majority of them had positive behavior towards mobile technologies for learning (Briz-Ponce, et. al., 2017). Also, the majority of undergraduate medical students were extensively using mobile technologies for academic and research purposes (Boruff & Storie, 2014; Bomhold, 2013). More than half of the students at Utah State University were using mobile technologies for academic purposes including accessing e-books, library catalogues, and journal articles (Dresselhaus, & Shrode, 2012) surfing search engines, online encyclopaedias, dictionaries, and other related tools (Bomhold, 2013).

However, a lack of interest and awareness was reported and they also had more inclination to use mobile devices for recreational purposes than academic and learning purposes. Chen (2019) described that majority of Fu Jen Catholic University, Taipei, Taiwan's undergraduates were found unaware of the availability of library apps for catalogue searching. However, despite their first use, they were reported to take less time to complete the task through the library mobile app. An Iran-based study by Taleb and Sohrabi (2012) on psychology and education students reported students were doing mere use of mobile for text messaging, using calculator and dictionary. Similarly, Lo et al. (2016) found that despite the ownership of smartphones and electronic devices, arts and design students at Hong Kong Design Institute were occasional users of these devices for learning purposes. Instead, they were interested in using smartphones for social communication and surfing the internet.

Economides and Grousopoulou (2008) and Rahamat, Shah, Din, and Abd Aziz (2017) found that students were using mobile technologies for recreational purposes ranked as making phone calls, taking photos, recording voices, and activating reminders. However, most of them were using their smartphones to surf the internet in handling information, downloading educational materials, and using social networking sites. Bomhold (2013) reported that undergraduates were donating a major portion of their time on mobile technologies to 'lifestyle' and health and wellness. Baggett and Williams (2012) described that university students were using mobile technologies for multiple purposes, including education, entertainment, and social and professional networking. Lau et al. (2020) conducted a comparative study to know mobile technologies use among LIS and Non-LIS groups at Peking University. Both the groups were using mobile technologies prominently smartphones to be engaged in research, pastime, recreational, social, and learning activities. However, the LIS group was less active in accessing available online resources and services.

Some studies that dealt with the use of mobile technologies among students had reported differences in technologies used based on gender and the program of study. There was a significant impact of gender on the use of mobile technology for educational purposes as females were more frequent users of mobile technologies for educational purposes than males (Taleb, & Sohrabi, 2012). Variation of results on academic use of mobile technologies was reported based on the students' discipline of the study at Utah State University (Dresselhaus, & Shrode, 2012). Dukic, Chiu, and Lo (2015) indicated that LIS students at the University of Hong Kong and University Tsukuba were widely using smartphones for learning purposes including accessing course materials, searching library catalogues and library materials, discussing assignments with classmates, and taking notes. However, Vassilakaki, Moniarou-Papaconstantinou, and Garoufallou (2016) indicated that LIS students use e mobile technologies and computers/laptops for academic purposes. Further, Lau et al. (2020) reported differences among groups of LIS and Non-LIS students at Peking University based on engagement with mobile technology as LIS students were less inclined to use electronic resources through smartphones.

Corona Virus (Covid-19) has emerged as disastrous for the world and required 'population-scale data' to counter it. The situation has enhanced the use of mobile and computer technologies to counter the gap of physical approach through virtual communication. During the Covid-19, use of mobile data was used but relatively it got less attention for educational purposes (Oliver, et. al., 2020). A relevant study was carried out by Zaidi et al. (2021) to check the adoption of mobile technologies in the pandemic situation through the implementation of the Technology Acceptance Model among Indian university students and verified that students shifted their traditional learning to m-learning during the Covid-19. A similar study Yuan et al. (2021) in the context of China by extending the TAM model through the application of an online questionnaire among university students. The study reported influencing factors including content quality of learning contents, user-friendliness of interfaces, and system connectivity.

Sengupta (2022) threw light on the facilities and challenges of e-learning among university students of India and reported that 47 (2.2%) did not have access to any technological device while students liked to take online classes preferably through Google Classroom and Microsoft Classroom. It was highlighted that students preferred smartphones for online learning whereas connectivity issues were raised as major obstacles in online education in the situation of the Covid-19.

Biswas, Roy, and Roy (2020) acclaimed that although a great majority of Bangladeshi university students had wide access to mobile technologies, they were less using them for academic purposes. They used mobile technologies due to their flexibility, ease of use, a good option to minimize the study gap during the pandemic, and their ease of finding, sharing, and reading relevant information. Hence, the current study was carried out to report the use of mobile technologies among university students during the pandemic.

Material Methods

Research Design

It was a quantitative study based on a survey research method. An online questionnaire survey was conducted to gather primary data from the students to understand their use of mobile technologies for academic as well as recreational purposes during the COVID-19 epidemic.

University of the Punjab, Lahore was chosen as it was one of the oldest and largest universities in the country and it had a diverse student's population who belong to all over the Pakistan. The data from this population might be generalizable to the students from other universities. Moreover, the researchers belonged to the same university, and it was convenient for them to collect the data from this student segment during the lockdown. Among the 13 faculties, the faculty of Economics and Management Sciences was taken that consisted of two departments and three institutes. There were more than 6,000 students in the faculty and the calculated sample size was 385.

A questionnaire was developed based on a literature review to understand how university students use mobile technology for academic and leisure purposes during the COVID-19 epidemic. Total 41 statements were developed that used a five-point Likert scale to collect data and meet the objectives of the study. There were three parts of the questionnaire including; demographic information, use of mobile technology among students for leisure and academic purposes during the COVID-19 pandemic, and challenges to use mobile technology.

Cronbach's Alpha was applied for measuring the reliability of the scale. The reliability of all the sub-constructs of the scale was ranged from 0.84 to 0.95 which indicated

the good reliability of the scale (Table 1). The values of these four constructs showed a satisfactory position of the scale.

Table 1
Reliability of scale

Scale	Statements	Cronbach Alpha
Use of mobile technology for leisure	9	.845
Use of mobile technology for academic purposes	11	.957
Use of mobile technology during Covid-19	13	.949
Challenges faced by students while using mobile technologies	8	.842

A questionnaire link was created and sent to the teachers of relevant departments and institutes through WhatsApp to circulate among their students during their online classes. Data were collected from 15th April to 15th May 2021 during the lockdown due to COVID 19 pandemic. Multiple reminders and personal efforts of the researchers played an important role to get timely responses.

Results and Discussion

Demographic Information of Respondents

Table 2 represented the demographics of participants. Female participation outnumbered (n=246, 67.4%) as compared to male participation (n=119, 32.6%) and it may be due to the overall high number of girls studying at the university. In the program category, the majority of participants (n=210, 57.5%) were doing a Master's degree whereas 120 (32.9%) were affiliated with BS program. However, only 24 (6.6%) MPhil and 11 (3%) PhD students participated in the survey respectively. The table showed a higher number of female students in all programs than male students.

Table 2
Demographic Information of Respondents

		Program				
		BS	MA	MPhil	PhD	Total
Gender	Male	38	71	7	3	119
	Female	82	139	17	8	246
Total		120	210	24	11	365

In the age group, more than half of the students (n=206, 56.4%) were categorized as 21-23 years of age while 69 (18.9%) fall in the age category of 18-20. Only 24 (6.6%) fall in more than 26 age categories. Due to the higher number of BS and MA students, the majority fall in the age range of 21-23 years as usually, students do their BS and Master degrees at this age.
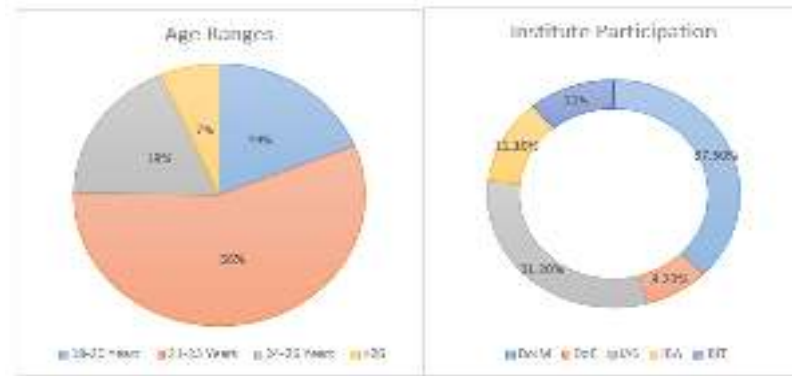
Figure 1 Age and institute of participants

More than one third of participants (n=137, 37.5%) belonged from the Institute of Information Management due to ease of access to the researchers as they were affiliated to it. Almost one-third of students (n=114, 31.2%) participated the Institute of Administrative Sciences whereas a lower percentage of students participated from the Institute of Business Administration, Institute of Business and Information Technology, and Department of Economics as 12.1%, 11%, and 8.2% respectively.

Table 3
Ownership of Electronic Device (Multiple Choices)

Electronic Device	Frequency
Smart Phone	360 (98.6%)
Tablet	23 (6.3%)
Smart Watch	15 (4.1%)
iPad	13 (3.6%)

Table 3 described the ownership of electronic devices among university students. Data showed that almost all students (n= 360, 98.5%) owned smartphones and 23 (6.3%) have access to the Tablets whereas the iPad was the least owned device by only 13 (3.6%) university students. It was established that students owned more than one electronic device (smartphone+ smartwatch / tablet / iPad). Among them, 21 (5.75%) have two electronic devices while only 14(3.84%) students owned three and / or four electronic devices.

Table 4 elaborated leisure time use of mobile technologies among university students. It showed that majority of the students were using mobile technologies for leisure activities, fulfilling their everyday information needs, and were remained engaged with social media applications such as Facebook, Messenger etc.

Table 4
Use of Mobile Technology for Leisure

I use mobile technology:	Mean	SD
most of the time	3.67	1.138
to search online for everyday information	3.66	1.063
to use other online tools (Facebook, messenger, etc.)	3.64	1.210
for entertainment	3.56	1.107
download music and games software from the internet	3.22	1.276
to browse for fun	3.21	1.162
to read online storybooks or novels	2.98	1.234
to chat online and to make new friends	2.95	1.291
to play games online or offline	2.72	1.289

Scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

The students were interested to use mobile technologies for entertainment purposes (M = 3.56, SD = 1.107), to download music and games (M = 3.22, SD = 1.276) and for the fun (M = 3.21, SD = 1.162). Surprisingly, they were least interested in playing online / offline games (M = 2.72, SD = 1.289), to chat online (M = 2.95, SD = 1.291) and to read storybooks or novels (M = 2.98, SD = 1.234). It was found that university students were less interested in storybooks or novels for leisure reading through mobile technologies.

The use of mobile technologies for the academic purpose among university students has been presented in Table 4. It showed that mobile technologies were facilitators of sharing academic materials (M = 3.90, SD = 1.141) and communicating with teachers and fellows (M = 3.87, SD = 1.148). These technologies also used to save electronic documents (M = 3.84, SD = 1.120) and provision of helping tools such as dictionary and encyclopaedia (M = 3.83, SD = 1.128).

Table 5
Use of mobile technology for academic purpose

Mobile technology	Mean	SD
facilitates me to email files or articles to anyone	3.90	1.141
assists me to use other online tools to contact teachers and class fellows	3.87	1.148
helps me save electronic documents	3.84	1.120
helps me use an online or offline dictionary and encyclopaedia	3.83	1.128
helps me in learning and understanding my courses	3.78	1.185
assist me to find the reference for further information	3.77	1.161
helps in participating in online forums related to the subject	3.72	1.180
enables me to learn and understand educational software's and quizzes	3.67	1.185
gives a good start to all my assignments	3.59	1.167
produce text (assignments) using a word processing program	3.58	1.173
supports me to create multimedia presentations	3.42	1.239

Scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

The students were getting help to understand their courses and to find the reference for further information through mobile technologies. These technologies were also helpful in understanding educational software and quizzes (M = 3.67, SD = 1.185). However, university students showed the least use of mobile technologies in creating multimedia presentations (M = 3.42, SD = 1.239), word documents (M = 3.58, SD = 1.173), and starting their assignments (M = 3.59, SD = 1.167).

During the Covid-19 pandemic, mobile technologies were used to search online information with highest mean (M = 4.01, SD = 1.125), and as a source of receiving and sending emails (M = 3.99, SD = 1.114) among university students. The students remained connected with their teachers, their loved ones, and with the outer world during the lockdown.

Table 6
Use of mobile technology during COVID-19

During COVID-19 epidemic, I use mobile technology:	Mean	SD
to search online information	4.01	1.125
to send and receive emails	3.99	1.114
lo learn about a particular topic I am interested in	3.98	1.097
to keep in touch with my loved ones	3.88	1.123

to connect to the outer world during lockdown	3.85	1.183
To get information from friends and peers	3.84	1.073
to learn collaborate and share ideas with each other	3.83	1.082
to take online lectures	3.82	1.231
to share or forward health information to my peers and family	3.77	1.027
for reading and watching news	3.41	1.151
to connect to the WHO app/website to get the news	3.33	1.149
to use helpline or emergency numbers for assistance with COVID-19	3.30	1.155
For some applications (e.g. Geo news app etc.)	2.93	1.159

Scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

The students were involved in collaborative learning (M = 3.83, SD = 1.082) and were taking online lectures (M = 3.82, SD = 1.231) through mobile technologies. These technologies were also used to share health-related information with family and peers and to read and watch the news. The lowest use of mobile technologies during pandemic was reported for some specific applications such as Geo News app (M = 2.93, SD = 1.159), to get assistance in case of emergency (M = 3.30, SD = 1.155) and to connect to the WHO website (M = 3.33, SD = 1.149).

In the critical situation of the pandemic, mobile technologies were the major source to connect with the academics and the outer world however, students were facing several challenges in using these technologies (Table 6). High pricing of quality mobile technologies was the major hurdle followed by their limited storage facility. The students were also facing compatibility issues with tools and devices (M = 3.30, SD = 1.07).

Table 7
Challenges faced by students while using mobile technologies

Mobile technology	Mean	SD
requires the high cost to buy high-quality devices	3.73	1.154
tools have limited memory and storage	3.37	1.154
has diversity and issue of compatibility with other tools or devices	3.30	1.072
has serious issues of data security while being transferred to other devices	3.27	1.102
tool waste a battery life in every activity	3.15	1.059
try to do all things for all people but do none optimally	2.89	0.928
is difficult to adapt	2.42	1.010
is complicated in use	2.39	0.987

Scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

They were also concerned about the data security during the transfer and the limitation of the battery life of the devices. However, in spite of many challenges they were facing they were using mobile technologies extensively.

Table 7 reported the effect of respondents' demographic variables (gender/ age/ department and educational level) on their perception to use mobile technology for leisure and academic purposes during the COVID-19 epidemic.

Table 8
Effect of gender, age, department, and program of study on mobile learning

Composite	Gender		Age		Department		Program	
Variable	t	Sig.	F	Sig.	F	Sig.	F	Sig.
Leisure	.914	.490	1.137	.150	1.473	.221	1.009	.403
Academic	.187	.120	1.297	.275	.558	.643	.960	.430
Covid-19	.278	.101	1.222	.301	1.270	.285	.834	.504
Challenge	.945	.014	2.465	.062	1.594	.190	2.390	.051

Independent Sample t-test and One Way ANOVA had applied to check the difference of opinion among university students based on their gender, age, department and program of study. The four constructs of the questionnaire; use of mobile technology for leisure, academic, during Covid-19 and faced challenges showed that there were no significant differences of opinion on any of the demographics of university students.

Discussion

The study was carried to find out the use of mobile technologies in the critical situation of Covid-19 among university students. It explored the use of mobile technologies for academic as well as leisure activities and the challenges faced by students in using these technologies. Female participation with middle-level age category (21-23 Years) doing master degree was the highest. Almost all students owned at least one electronic device that was a smartphone and this finding also reported by several studies (Al-Emran, Elsherif, & Shaalan, 2016; Boruff, & Storie, 2014; Briz-Ponce, et. al., 2017; Dresselhaus, & Shrode, 2012; Rahamat, Shah, Din & Abd Aziz, 2017). Findings indicated that majority of the students used mobile technologies for entertainment purposes including getting everyday information and surfing social media tools. Many research studies found that university students were engaged in academic as well as recreational activities through mobile technologies i.e. searching library catalogues and related search engines, accessing e-books, downloading and reading journal articles, consulting dictionaries and encyclopaedias and the students were reported to use mobile technologies for text messaging, social and personal communication, and surfing the internet (Bomhold, 2013; Boruff & Storie, 2014; Dresselhaus & Shrode, 2012). The current study found that university students were less interested in reading online storybooks, chatting online with friends, and playing online or offline games.

It has been inferred that university students were widely using mobile technologies for academic and research-related activities. They used online tools to search articles, send emails, and to contact their fellows and teachers. Through mobile phone they used to save documents, use online/offline dictionaries and encyclopaedias, find references, and participate in subject-related online forums. During the Covid-19 situation, university students preferred to share online information through mobile technologies to maintain social distancing. They sent and received emails and and kept in touch with their loved ones. Via mobile devices they connected to the outer world, got and shared information with friends and took online lectures in pandemic. However, they were less interested to use the emergency helpline during the Covid-19 situation. Many studies that dealt with mobile technology use during the Covid-19 situation reported the use of mobile data and mobile apps to track patients' location, mobility, travel history, symptoms, clinical outcomes, and reporting of patients (Drew, et. al., 2020; Oliver, et. al., 2020; Park, Choi, & Ko, 2020; Wang, Ng, & Brook, 2020). The university students were also facing challenges while using mobile technologies such as high cost of quality mobile technologies, limited memory and storage, data security, and compatibility issues for academic and recreational activities during Covid-19.

The current study found no difference of opinion based on gender, age, and educational level and literature also supported that no gender (Al-Emran, Elsherif, &

Shaalan, 2016; Economides, & Grousopoulou, 2008) and age (Al-Emran, Elsherif, & Shaalan, 2016) differences were reported in using mobile technologies. However, gender differences were reported based on academic use of mobile technologies as females were found more frequent users of mobile technologies for academic purposes (Taleb, & Sohrabi, 2012). The discipline of study was also found a factor that affected academic use of mobile technologies (Dresselhaus, & Shrode, 2012). Lau et al. (2020) also reported differences among LIS and Non-LIS students while approaching electronic resources through electronic devices. In this respect, future investigations are suggested to explore gender and discipline of study factors affecting academic as well as recreational use of mobile technologies among university students.

Conclusion and Recommendations

This is a quantitative study based on a survey method. It was carried out to infer the use of mobile technologies for leisure, and academic purposes during the COVID-19 among university students. A questionnaire was sent to students' WhatsApp groups to collect the data from them.
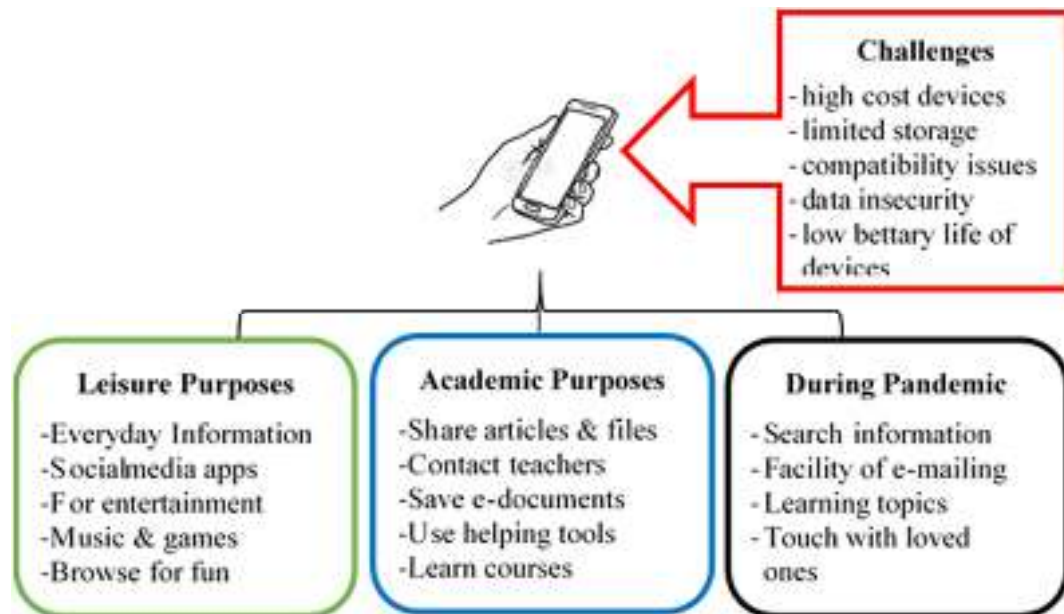

Figure 2 A comprehensive picture to use mobile technologies among university students

Figure 2 depicted that university students used mobile technologies and social media apps for entertainment and fun. They were also sharing and saving academic documents, and communicate with their teachers and fellows. However, it is quite encouraging that despite the critical situation of the Covid-19, they were using mobile technologies to engage in academic activities as well as to keep in touch with their loved ones.

Conversely, university students were outspoken about the challenges they faced while using mobile technologies including high pricing, limited storage facilities, compatibility issues, data insecurity, and low battery life of the devices. The situation revealed that university students had access to at least one electronic device that was smartphones and they were widely using these devices for leisure, and academic purposes during the pandemic.

In the context of Pakistan, the 'CM Punjab Laptop Scheme' and the 'Prime Minister's Laptop Scheme' were the initiatives to provide laptops to the matric, intermediate as well as

university students. The government should continue these schemes and also initiate new schemes to provide compatible devices and technical support to university students.

Due to time and resource constraints, the study was limited to only the 'Faculty of Economics and Management Sciences'. Future research may be carried out to explore other faculties of the university as well other research settings. Less interest of university students in leisure reading through mobile technologies requires exploration of the phenomenon of print vs electronic materials.

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