

## Usability and Accessibility of Internet by the University Students of Pakistan

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### Abstract

*In the modern age of technologies, the adoption of the Internet has brought drastic changes in the life of human beings. These changes may be sometimes positive and sometimes negative. However, such changes depend on the usability of the Internet based on the needs of the users. Keeping in view that the Internet has the potential for both positive and negative impacts on the lives of students; this study was undertaken in the context of students at Kohat University of Science and Technology (KUST), Pakistan. To this end, this formulated three major objectives that were measured through different questions. The study adopted a quantitative approach and used a survey method. A questionnaire was used as a data collection tool. Data was collected from a randomly selected sample of students of BS and MS currently enrolled in different study programs of KUST. The collected data was analyzed through SPSS (ver23) and MS Excel. The results were presented both in tabulated and diagrammatic forms. Based on the results, it was found that students in the KUST are sufficiently able to use Internet. These students can use different electronic gadgets for the use of Internet to accomplish their academic and other educational needs. Likewise, the results showed that the major purpose of the use of Internet at the KUST was reported as entertainment and thus was established that these students rarely used Internet for their educational and research activities. Furthermore, the findings showed that students in the KUST used the Internet at their hostel but prefer to have adequate access to it in their IT department. Similarly, it was also found that the major tool used by these students for Internet usability is cell phone and have little or limited or no use of iPad and tablets for the use of the Internet. All these results were further validated with one-way ANOVA test and independent sample t-test to affirm that any suggestion or recommendations or actions at any level may be considered in the light of the demographic characteristics of the study participants. This is with the purpose that all results based on these tests were found significant with respect to the demographic features.*

**Key Words:** Internet- University Students, Usability of internet- Kohat University of Science & Technology, Accessibility of internet- Pakistan, Emerging Technologies- use of Internet-Pakistan

### Introduction

The Internet refers to interconnected computers to communicate based on protocols and standards. The Internet referred to as the World Wide Web (WWW) is accessible from any location in the world. It is a search engine that offers accurate and relevant information that is the result of human research. The Internet is an imperative source of information and entertainment that enables individuals from all walks of life to connect with others globally (Khan, 2017). The Internet is also defined as the set of LANs (Jan, 2015). It evolved from the Advanced Research Project Agency Network - a department of defense agency of the US that connected four computers at California State University in September 1969 to provide online services (Pastor-Satorras & Vespignani, 2007).

Currently, throughout the world, the Internet has 4.66 billion active users with an approximately sixty per cent access rate. However, in Asia, there are 4, 327, 33,821 internet users and researchers,

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which is sixty-four per cent of the total users of the internet worldwide. (We are social, 2022). According to a survey, there are five billion users of the internet which is sixty-three per cent of the global population. Even though in 2022 its number increased to 200 billion but still three billion people are still unconnected in Asia and Africa (<https://datareportal.com/global-digital-overview>). In 1995, an entrepreneurial Internet business called Digicom launched an online Internet service in Karachi. This initiative provided a path to the use of Internet-based services in Pakistan. In 1996, PTCL started the Internet with 512 Kbps subscribed by 8500 customers in Pakistan. In 1997, Nine Internet Service Providers (ISP) was functioning in the five different cities of Pakistan that provided services to 25000 subscribers. Likewise, several different Internet service providers appeared quickly the following up on the Internet (Wolcott and Goodman, 2000). Later, the number of users expanded extensively more than the last 19 years in 2000 which was estimated at 133,900 internet users. Later on, after six years in 2006, this number climbed to 12,000,000 Internet users. In Pakistan, the internet user base climbed from 18,500,000 in 2009 to 34,342,400 in 2016. Similarly, in 2018 it was reported that there are 44,608,065 active users of Internet-based services in Pakistan (<https://www.internetworldstats.com/stats.htm>). According to this report, the widespread availability and usability of Internet-based services including mobile technologies and social media in Pakistan have resulted in a huge increase in internet adoption. Pakistan presently has 61.34 million active internet users and 173.2 million active mobiles (<https://www.internetworldstats.com/stats.htm>). The internet gained its importance in recent years due to its multiple attractive services and features such as technological improvements, and easy access to information and knowledge resources.

The government of Pakistan is continuously struggling to expand the internet and its services to every individual in the society in Pakistan. To this, the Higher Education Commission (HEC) of Pakistan has launched PERN providing the Internet academic institutions in Pakistan. This service is currently on-campus and can be accessed with the login facilities provided by the IT departments in the respective universities and HEI, especially to the researchers and faculty that further enabled them to access the research resources provided through the HEC National Digital Library of Pakistan. The prompt availability of the Internet services and resources in any educational institution has generated multiple challenging scenarios in terms of teaching, learning, research and overall students' educational processes not merely in developing countries but throughout the world (Khan & Bhatti, 2011). The primary reason for which university students utilize the internet is to search for jobs and complete a variety of other tasks and their university class assignments, academic presentations and research projects. These students have unrestricted access to the internet, enabling them to obtain information and expertise about higher education quickly. The majority of students expressed favorable attitudes toward using the internet to gain information, learn new skills, and conduct worldwide research. University students should perceive the internet as a tool to be used for academic, research and other information and knowledge resources for the successful accomplishment of their academic and academic projects.

Not only the Internet has increased the value of traditional library services, but it has also enabled libraries to launch novel services in constantly changing environments. Nowadays, libraries are expected to provide Internet-based services, in the same manner in the same style as they do with books and other knowledge. Pakistan's government has taken major steps to promote the use of the Internet especially the information communication technologies in both public and private sector universities including the Virtual University and the Higher Education Commission's Digital Library of Pakistan. Every public, as well as the private sector university library in Pakistan, now has full-fledged Internet connectivity, which they use to provide various

informational and educational services to manage knowledge management activities. However, there it does not appear that library users explicitly students in all forms may understand its usefulness or applicability to library services. While Internet use has been ingrained in Pakistani culture over the previous two decades, the output remains unquantifiable ([www. library science. in/2020](http://www.libraryscience.in/2020)).

The Kohat University of Science and Technology (KUST) Pakistan was established as a public university on August 30, 2001. Lieutenant General Syed Iftikhar Hussain Shah, Governor of Khyber Pakhtunkhwa honored the inaugural session and officially opened the doors of this university for the people of Kohat. There are sixteen departments and twenty-four disciplines or academic departments. Currently, in KUST there are Six thousand and ninety students enrolled in different academic departments. These students include 4098 undergraduates, 937 graduate students and 55 doctoral students. It has one satellite campus in Hangu District (<https://kust.edu.pk/kust>).

### **Research Objectives of the Study**

This study has attempted to achieve the below research objectives in the context of Internet usability among the students enrolled in diverse types of academic programs in the KUST:

- 1) To ascertain the purpose for which students at KUST use the Internet;
- 2) To know students' satisfaction with the Internet service in the KUST;
- 3) To explore the major impediments/barriers to the use of the Internet among the students in KUST.

### **Research Questions of the Study**

The below are research questions for this study:

- 1) What is the purpose of the use of the Internet among the students enrolled in different academic programs at KUST?
- 2) How satisfied are the students enrolled in different academic programs with the internet service provided at KUST?
- 3) What are the major impediments/barriers faced by the students enrolled in different academic programs while using the Internet services at KUST to accomplish their academic and other research tasks?

### **Literature Review**

The use of the Internet in the scholarly world and society has expanded rapidly and thus has become an essential entity for academic and professional lives. Besides the students and researchers, teachers in any educational institution equally use the Internet to set out their teaching materials. Studies in the past have demonstrated that nearly ninety-one percent of the use of the Internet has increased especially for communication and socialization. It has been further demonstrated that the majority of the public uses the Internet for messaging such as thirty-eight percent of the Internet users adopt the Internet for text messaging while thirty-five percent utilize the Internet for personal communication.

According to Fatema *et al.* (2020), the Internet is used by university students for the retrieval of information resources related to their educational, learning, and research needs. Further, the findings of this study illustrated that the Internet is used by fifty-six percent of the students for educational purposes, 24% adopt the internet for entertainment, and forty-four percent of the students' internet for social networking thus the majority of them consult the social sites for it. According to Saha (2019), in the context of university students, academic achievement and success have a direct positive and significant impact on the use of the Internet while it negative

and insignificant impact on socialization. According to Kumah (2015), although the majority of university students use the Internet to fulfill their information and knowledge needs. However, these students haven't addicted to it, spend a lot of time on it, and search and acquire the information without focusing on its quality. Despite its adverse effects, the use of the Internet is still favorable to students. It is expected from students in almost all kinds of educational institutions that the Internet is an innovative technology that can be used for learning and research. It enhances students' learning and research capabilities by providing the latest information and knowledge resources. It informs about the global trends, in research and academic activities related to their field of study or specialization. The best thing about the Internet is that it can be accessed from anywhere. Thus, students should have a good experience on the Internet regarding any academic activities or social networking (Adeyinka, 2007).

Researchers in the past have suggested that students should get assistance from the internet and perform extra efforts to use it for their academic purposes (Muniandy, 2010). According to Shukla and Shinde (2016), it is important to know how students interact with the Internet, how they use it, how they use the Internet on their smartphones, and how much money they spend on it. Likewise, Siraj *et al.* (2015) explored the correlation between the Internet and academic performance among students in Malaysian Public Universities. The major purpose of this study was to define the association between Internet usage and students' academic achievements. The results showed that Internet has a strong correlation with students' academic performance. Furthermore, at the Mohanlal Sukhadia University Library India, Hinger and Hasan (2012), investigated the attitude of students towards the use of the Internet. The study aim was to know the internet suitability for the library and the use of internet-based resources among the students. Similarly, Terali and Tugun (2011) examined the university students' internet usage at the East University of Cyprus. The major aim of this research was to assess the usage level of the internet among the students.

### ***Local Literature***

Many college students use internet services for academic projects. They use the Internet to fulfill their academic assignments such as the completion, and assembling of course-related notes (Bashir *et al.*, 2016). The users should change their using approaches toward the internet to focus on opportunities that provide for our educational achievements (Khan, 2017). It is well-documented in past research studies that the Internet equally affected their social lives. To this end, the literature review assumed that as Internet has the ability to addiction, thus there should be a negative impact of it (Asdaque *et al.*, 2010). Likewise, Jan (2015) established that for the adequate use of the Internet, information searching techniques, provision of electricity, and up-to-date workstations are needed. In another study, Jan *et al.* (2018) showed that the low speed of the internet and the lack of ability to use the Internet are major challenges faced by the users.

Similarly, Ahmad and Rafiq (2016) stated students use the internet for entertainment instead of educational activities. This study additionally reported different types of barriers that hamper the use of the Internet among students. Moreover, Manzoor (2014) investigated the behavior of Pakistani University students during the use of the Internet. It was reported that students prefer to adopt the Internet for research and other academic projects. The results showed that most of the respondents revealed that the Internet saves their time to accomplish class or course-related assignments. Similarly, Sheikh *et al.* (2013) indicated that students prefer to use the Internet at

the University of Peshawar with the intention to finish their work quickly. However, it was suggested that training facilities should be provided for the students at the campus to enable them more in the effective use of the Internet. Furthermore, Chhachhar *et al.* (2013) reported that knowledge is required to inform the students about the adequate utilization of the Internet. In addition, Naz *et al.* (2011) evaluated how medical students use the Internet. The findings showed that training is required for medical students to tell them how to suitably use the Internet. Further, Khan and Bhatti (2011) identified that the quality of the Internet provided by HEC is poor and needs improvement. Additionally, Asdaque *et al.* (2010) and Bashir *et al.* (2016) stated that Internet has a positive influence on academics while negative on the social lives of the students and the students use the Internet for reading purposes.

Based on the above review it is deduced that the Internet is very dominant among the students at the university level. Students use the Internet for educational social, and entertainment activities. Likewise, the use of the Internet has positive and negative impacts on students' performance. The majority of the researchers in the past have suggested training programs for the students to learn the adequate use of the Internet. In addition, the majority of the researchers have highlighted different barriers to the use of the Internet and further suggested that higher authorities address these issues.

### **Research Method and Design**

The present study is based on the positive paradigm of research and thus selected the quantitative approach or research design of the study.

#### *Data collection sources*

In a research study, there are mainly two types of data collection sources that the researcher used, which are explained as: (a)-From a primary source, also known as the original source or data, researchers collect data for the first time. Here, primary data was collected by the researcher through a questionnaire related to the usability of the Internet. This primary data was collected from BS and Master Students last semester from KUST Pakistan. (b)- Published data already existed for use in the form of relevant research papers, case studies, and published reports to support the literature of the study. This type of data is usually used for literature review support and analysis of the literature in the final study.

#### *Instrumentation*

For the construction of the data collection tool, the researchers collected some previously validated instruments. Firstly, a literature review was conducted to search for these instruments. Then the selected tools were reviewed to check their suitability and further usability. The questions in these instruments were assessed and prepared our own instrument for data collection that was completely relevant to our study context. Firstly, the list of questions was examined for duplication. Then repeating questions were excluded. Then list was re-examined to reduce its length. Hence, a final draft was designed. In the draft instrument, all the questions were properly coded which was helpful in data collection, data cleaning, data entry, and later on in analyses. Few spaces were also given for respondent suggestions. For this, the draft questionnaire was shared with the five experts in LIS in Pakistan. They examined the tool and suggested some changes which were then included accordingly. The content and face validity were established. All recommended changes were added to the final questionnaire. Thus, the questionnaire was thoroughly revised. Further, through

pilot testing, the revised instrument was modified as stated by the participants. These participants were then excluded from the actual surveys. The final version of the questionnaire was composed of four main sections namely demographics, the purpose of internet use, satisfaction level, and major barriers to the use of the internet. The demographic profile included information about the gender, department, semester, CGPA, the purpose of internet usage, and satisfaction of usage of internet. In the second part of the instrument, the questions were included about monthly usage of the internet, average per day usage of the internet, barriers in the use of the internet, and the most important suggestions to improve the internet facility.

### ***Population and Sampling Techniques***

The target population of this study was the Master and Bachelor students of the final semester of KUST Khyber Pakhtunkhwa. In order to collect the desired and accurate information about the total population, the academic section of the KUST was approached. The researcher assumed that final semester students are the senior students and have more knowledge of the usability of the Internet and thus other semesters' students were excluded from the study. Additionally, the final list of the total students was obtained from the academic section of the KUST Kohat KP. The current enrollment for the final semester was 130 for the BS final semester and MS enrollment was N=110 students for the final semester and the total population was 240. In this study, random sampling was used, and then the sample was calculated through the Raosoft sample calculator. After using the sample size calculator, 148 was reported as sample size of the present study, but the whole figure 150 was assumed as the unit of sampling.

### ***Data processing and analysis***

When data from the targeted sample of the study was collected, the researcher moved to the next stage of data analysis. In the initial process, data was processed with data mining techniques to make a sheet of respondents. SPSS- Statistical Package for Social Sciences (Ver.23) was used for data analysis. Before data entry in the software, the unusable questionnaire consisted of errors, and missing values were discarded. Then coding was done on the questions and questionnaires. The data analyses were composed of both descriptive and inferential statistics. The descriptive measure included mean, SD, and ranks while inferential consisted of t-tests and ANOVA tests respectively.

### ***Ethical Considerations***

The consideration of ethical values in research is essential for significant findings especially in social sciences to eliminate any issues that arise from consultation with the human (Cohen, Manion and Morrison, 2007). In this study, since the researcher has collected data from the students of KUST thus following ethics were followed:(a)-During this study, study emotional and social safeties were ensured at the KUST. (b)- Data was collected by the researchers and no other person was used during any phase of this research.(c)- Students were informed that their response will be only for intellectual benefits and nothing else. (d)-No unethical question was asked from the participants. (e)- Prior respondents' permission was taken before the data collection.

### **Data Analysis and Interpretation**

This study aimed to examine Internet usability among the students at KUST Pakistan. The researcher measured three major research questions formulated to address the purposes of using

the Internet, satisfaction regarding the use of the Internet, and barriers faced by the BS and MS students while using the Internet.

### ***Response Rate***

A total of 150 questionnaires were distributed among BS and MS students at the KUST Pakistan. At the start, the participation and response were very poor. The researcher received 70 surveys back. Then follow-up meetings were made and then 100 surveys were received after 2 weeks. Again the same method of contacting the participants was made to improve the response. The 3<sup>rd</sup> contact yielded 121 questionnaires. After 6 weeks, another contact was made and then 145 surveys were received in total. Finally, 148 questionnaires were returned by the respondents. Based on the useable questionnaires, the response rate of this study was calculated as 98.6%. The population, sample size, questionnaire distribution, and response rates are provided in Table 1.

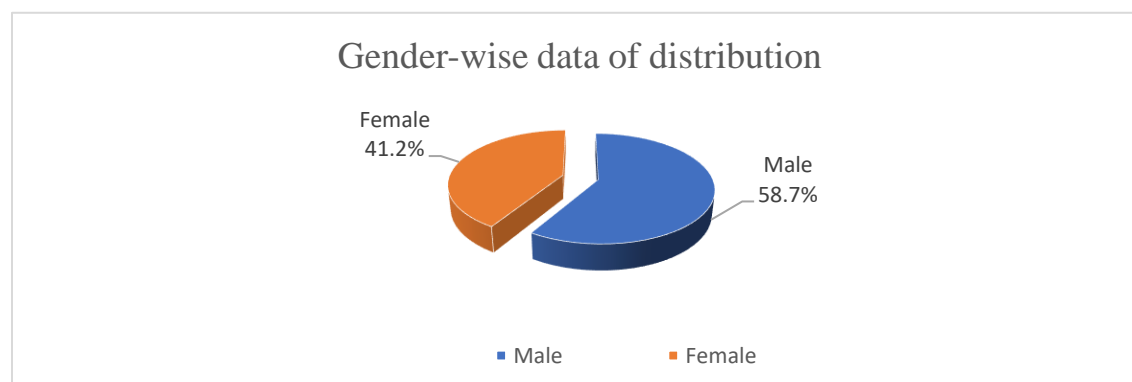
**Table 1: Survey and tool Description**

Categories	N	n	Instruments Distributed	Returned Instruments	Useable Instrument
BS and MS students	240	148	150	150 (100%)	148(98.6%)

### ***Demographic Characteristics***

As data were collected from the BS and MS students of the final semester at KUST, thus the demographic profile of the study respondents is presented in the below figure. According to the gender of the respondents, it is evident that participants of the study were male students (n=87, 58.7%) as equated to female students (n=61, 41.21%). A diagrammatic presentation of gender-wise data has been provided in Figure 1.

*Figure 1*



As shown in Table 2, the majority of the students were fewer than 20 years (n=127, 85.8%), followed by 21-30 years (n=21, 14.2), and more than 30 years (n=0%) respectively.

**Table 2: Participation and Age**

Age groups	<i>f</i>	% age
<20 years	127	85.8%
21-30 years	21	14.2%
More than 30 years	0	0%
<b>Total</b>	<b>148</b>	<b>100%</b>

Likewise, as shown in Table 3, data regarding respondents' program of study indicated high participation from the BS program followed by the MS.

The discipline of the study-wise data distribution of the respondents showed that 42.56% (n=63) of the students who participated in this study were from the department of computer science, followed by 23.64% (n=35) students were from the faculty of social sciences, 20.27% (n=30) were from the faculty of management sciences, and 13.51% (n=20) students were from the faculty of environmental science. The category of CGPA data distribution indicated that the scores of the majority of the students (n=63, 42.56%) were in the range of 2.00 to 2.50, followed by 3.00-3.50 (n=36, 24.32%), 2.50-3.00 (n=36, 24.32%), and 2.50-3.00 (n=13, 08.78%). Figure 5 shows data distribution based on the CGPA of the students.

#### *Findings of the study*

Based on the objectives of the study, the following findings are deduced:

#### *Places of using the Internet*

This question was related to the purpose of identifying where students in KUST use the Internet for different purposes. This section of the study has consisted of five locations used for Internet utilization at KUST, Pakistan. The results in Table 4 indicated that mostly students use Internet at the hostel (n=42, 28.37%) followed by the classroom (n=36, 24.32%), computer lab (n=31, 20.94%), home (n= 23, 15.54%), and university library (n=16, 10.81%). These results further indicated that the Internet facility of the university has the lowest utilization at the university library. Based on ranking, the students are highly interested to use the Internet in the computer lab at their department while have shown little interest in the use of the Internet at libraries.

**Table 3: Places of using the Internet**

#	Places	<i>F</i>	% age	<i>M</i>	<i>SD</i>	Ranking
1	Computer Lab	31	20.94%	4.23	.741	1
2	Class Room	36	24.32%	4.17	.326	5
3	Home	23	15.54%	4.13	.435	2
4	Student hostels	42	28.37%	4.11	.674	3
5	KUST university libraries	16	10.81%	4.07	.578	4
Total		148	100%			

*Measuring the gender-wise significance of the difference-* for this purpose t- test was applied. The significance was considered as  $p \leq 0.05$  values. Results in Table 3 showed four significant



differences while one is insignificant. Hence, the places or locations where the students use the Internet also have its effects.

**Table 4: Places to use the Internet: gender-wise distribution- Independent sample t-test**

No	Places categories	Male students (n= 87)		Female students (n= 61)		t-test sig. (2-tailed) $p \leq 0.05$
		M	SD	M	SD	
1	Computer Lab	4.21	.332	3.99	.461	.091
2	Class Room	4.17	.411	4.64	.433	.002
3	Home	4.19	.645	4.11	.465	.031
4	Student hostels	4.07	.555	3.25	.319	.000
5	KUST university libraries	4.91	.901	3.96	.456	.010

*Measuring the age-wise significance of the difference-* for this purpose, a One-way ANOVA test was applied. The significance was considered as  $p \leq 0.05$  values. Results in Table 5 showed four significant differences while one is insignificant. Hence, the age and usability of the Internet among the students may have link.

**Table 5: Places to use the Internet: age-wise data distribution and one-way ANOVA test**

#	Places categories	<20	21-	>30	F	Sig. $p \leq$ 0.05
		years	30	years		
		M	M	M		
		(SD)	(SD)	(SD)		
1	Computer Lab	4.34 (.513)	4.46 (.645)	0.00 (.000)	.341	.011
2	Class Room	4.19 (.602)	4.33 (.813)	0.00 (.000)	.452	.040
3	Home	4.11 (.721)	4.27 (.802)	0.00 (.000)	.647	.020
4	Student hostels	4.02 (.810)	4.19 (.680)	0.00 (.000)	.364	.000
5	KUST university libraries	3.92 (.744)	4.11 (.527)	0.00 (.000)	.842	.903

*Measuring the program-wise significance of the difference-* for this purpose, t-test was applied. The significance was considered as  $p \leq 0.05$  values. Results in Table 6 showed all significant differences and insignificant differences among the statements. Hence, the program of study and locations of the Internet usability perhaps are interrelated.

**Table 6: Places to use the Internet: program-wise distribution- Independent sample t-test**

#	Places categories	BS students (n= 85)		MS students (n= 63)		t-test sig. (2-tailed) $p \leq 0.05$
		M	SD	M	SD	
1	Computer Lab	4.56	.512	4.33	0.54	.041

2	Class Room	3.99	.319	4.22	.461	.031
3	Home	4.87	.643	3.88	.530	.011
4	Student hostels	4.81	.501	4.53	.439	.000
5	KUST university libraries	4.93	.471	4.65	.620	.000

*Measuring the discipline-wise significance of the difference-* for this purpose, a One-way ANOVA test was applied. The significance was considered as  $p \leq 0.05$  values. Results in Table 6 showed two significant differences while three results are insignificant. Hence, the discipline of the study and locations of Internet usability among the students may have a link.

### ***Tools adopted for the utilization of the Internet***

This question was related to the purpose of identifying which tools the students in KUST use for the use of the Internet. This section of the study has consisted of six tools used for Internet utilization at KUST, Pakistan. Results are shown in Table 7. The students supported the use of three devices except for the iPad, Samsung Tablets, and the category others. However, only two students indicated that they use Samsung Tablets for the Internet. The tool highly adopted by the students at KUST is the use of cell phone ( $n=86$ , 58.10%), followed by a personal computer ( $n=33$ , 22.29%), laptop ( $n=27$ , 18.24%) and Samsung tablets ( $n=2$ , 1.35%). Further, the results showed that students in the KUST ranked the use of Apple iPad as the 1<sup>st</sup> priority, cell phones as the 2<sup>nd</sup> priority, and Samsung Tablets as the 3<sup>rd</sup> option. The “others” category didn’t receive any ranking. These results established that students in the KUST have knowledge of the tools to be used for the Internet. The responses demonstrated that these tools possibly assisted them in the right use of the Internet during their academic activities.

**Table 7: Tools adopted for the utilization of the Internet**

#	Tools	f	% age	M	SD	Rankings
1	Personal computer	33	22.29%	4.93	.722	4
2	Laptop	27	18.24%	4.79	.443	5
3	Cell phones	86	58.10%	4.77	.533	2
4	Apple iPad	0	0%	4.56	.744	1
5	Samsung Tablets	2	1.35%	4.46	.310	3
6	Others	0	0%	4.42	.562	0
	Total	148	100%			

### ***Purposes of the use of the Internet***

The result in Table 8, out of the ten categories, the students did not support the use of three purposes. However, only three students indicated that they use the Internet for library digital services. The purpose highly indicated by the students at KUST is the use of Entertainment ( $n=134$ , 90.54%), followed by a social media ( $n=113$ , 76.35%), sports ( $n=107$ , 72.29%), research academics ( $n=87$ , 58.78%), online shopping ( $n=71$ , 47.97%), online games ( $n=54$ , 36.48%), news ( $n=47$ , 31.75%), software loading ( $n=31$ , 20.94%), jobs ( $n=9$ , 6.08%) and library digital services ( $n=3$ , 2.02%). Further, the results showed that students in the KUST ranked entertainment as the 1<sup>st</sup> priority, social media as the 2<sup>nd</sup> priority, and sports as the 3<sup>rd</sup> option. However, the interesting results are that only three students indicate the usability of the Internet for searching and retrieval of library digital services. Further, these students have ranked the use of the Internet at the library as the 7<sup>th</sup> option. Likewise, the use of the internet for the job was ranked the lowest level which the 10<sup>th</sup> position.

**Table 8: Purpose of use of the Internet**

#	Purposes	f	% age	M	SD	Rankings
1	Entertainment	134	90.54%	3.93	.702	1
2	Jobs	9	06.08%	4.81	.343	10
3	Online shopping	71	47.97%	4.43	.413	6
4	News	47	31.75%	3.89	.643	9
5	Sports	107	72.29%	3.76	.512	3
6	Software downloading	31	20.94%	4.12	.682	8
7	Online games	54	36.48%	3.91	.511	5
8	Social media	113	76.35%	3.88	.444	2
9	Research and academic	87	58.78%	3.65	.702	4
10	Library digital services	3	02.02%	3.59	.378	7

### Sources of learning about the Internet at KUST

This part of the study consisted of twelve sources through which students at KUST came to know about the use of the Internet. Regarding this question, the students were asked to respond as much as applicable. Later, these were requested to rank the 1<sup>st</sup> three sources that mostly assisted them as a source of Internet learning at KUST, Pakistan. The response of students was measured for each source of Internet learning and the results are shown in Table 11. The students supported all of them. However, no students indicated the admission office as a source of learning the Internet at the KUST. Further, only three students indicated that they use the Internet for library digital services which alarming situation for the librarians.

The major Internet learning source indicated by the students at KUST is the course teacher (n=141, 95.27%), followed by a classmate (n=108, 72.97%), senior students (n=78, 52.70%), research supervisor (n=63, 42.56%), head of the department (n=56, 37.83%), other departments students (n=34, 22.97%), researchers (n=23, 15.54%), parents (n=19, 12.83%), librarians (n=7, 4.72%), IT department (n=2, 1.35%), notice boards (n=2, 1.35%) and admission office (n=0, 0%). Similarly, the results showed that students in the KUST ranked research supervisor as the 1<sup>st</sup> priority, classmates as the 2<sup>nd</sup> priority, and researchers as the 3<sup>rd</sup> option. However, only seven students indicated the choice of the librarian as an Internet learning source. Further, these students have ranked librarians at 9<sup>th</sup> position. Likewise, students at KUST established that notice boards, IT departments and librarians are not playing a sufficient role in informing students about Internet learning. Further, for more understanding and clarity, the response to these sources of learning about the use of the Internet has illustrated in Figure 7.

**Table 9: Sources of learning about the Internet at KUST**

#	Sources	f	% age	M	SD	Rankings
1	Parents	19	12.83%	4.63	.611	10

2	Head of the Department	56	37.83%	3.77	.543	8
3	Librarians	7	04.72%	4.53	.422	9
4	Classmates	108	72.97%	4.97	.701	2
5	Researchers	23	15.54%	4.89	.381	3
6	Admission office	0	00.00%	4.80	.529	12
7	IT department	2	01.35%	4.75	.631	11
8	Senior students	78	52.70%	3.99	.364	4
9	Courses teacher	141	95.27%	3.81	.451	5
10	Other department students	34	22.97%	3.78	.392	6
11	Notice Boards	2	01.35%	3.59	.378	7
12	Research supervisor	63	42.56%	3.52	.638	1

### Students' satisfaction with the Internet facility at KUST

Regarding this question, the majority of the students are not satisfied with the quality, speed, availability, and access to the Internet at the KUST. However, some of the students indicated their satisfaction with all these indicators of Internet usability.

**Table 10:** *Students' satisfaction with the Internet at KUST*

#	Questions	f	%age	M	SD
1	I am not satisfied with the speed of the Internet at KUST	140	94.59	4.91	.456
2	I am happy with the quality of Internet at KUST	97	65.54	4.88	.720
3	At KUST, the Internet is most of the time is unavailable	131	88.51	4.56	.346
4	The speed of the Internet at KUST is fast	67	45.27	3.99	.355

### Barriers to the use of the Internet

This section of the study consisted of nine barriers faced by the students in the use of the Internet. Regarding this question, the students were asked to respond with a suitable choice. Later, these students were requested to rank these barriers for better usability. As shown in Table 24, all nine barriers faced by students are supported.

The major barrier indicated by the students at KUST is no electricity (n=146, 98.64%), followed by low of the Internet (n=131, 88.51%), digital divide (n=87, 58.78%), Internet skills (n=86, 58.10%), no research needs (n=56, 37.83%), lack of interest (n=17, 11.48%), infrastructure (n=13, 8.78%), lack of time (n=12, 8.10), and affordability (n=3, 2.02%). Similarly, the results showed that students in the KUST ranked barriers faced by them in the use of the Internet are no electricity as 1<sup>st</sup>, no research needs the 2<sup>nd</sup>, and low Internet speed as the 3<sup>rd</sup> barrier and established the major three barriers.

**Table 11:** *Barriers to the use of the Internet at KUST*

#	Barriers	f	% age	M	SD	Rankings
1	Lack of interest	17	11.48%	4.33	.648	6
2	Affordability	3	02.02%	4.21	.719	9
3	Internet skills	86	58.10%	4.09	.302	7
4	Infrastructure	13	08.78%	4.01	.596	8

5	Low speed	131	88.51%	3.98	.801	3
6	Lack of time	12	08.10%	3.96	.634	4
7	Digital divide	87	58.78%	3.89	.911	5
8	No research needs	56	37.83%	3.82	.377	2

## Discussion

For understanding the purposes of the use of the Internet, different questions were asked from the students at KUST. The responses to these questions were rated on the basis of mean value and were then tested through t-test and one-way ANOVA to examine the significance of the results in terms of the demographic features of the respondents. Regarding a question that was related to the ability to use the Internet by the students in KUST, it was identified that the majority of the students understand the use of the Internet. These students know how to use the Internet. These students are able to utilize all the resources provided through the Internet at KUST. However, it was mentioned that these students are unable to fix the issue encountered by these students during the use of Internet. Jan (2020) reported that students at Khushal Khan Khattak University Karak Pakistan also know about the proper usage of internet but are not too much smart to locate the required information timely. A question was asked about the purpose of identifying the places for using the Internet by the students at KUST. Based on ranking, the students are highly interested to use the Internet in the computer lab at their department while have shown little interest in the use of the Internet at libraries. From these results, it is deduced that students prefer to use the Internet in their hostel. The major concern of these results is that students are not using the Internet in the libraries of the KUST. It is inferred that either the Internet is not available in the libraries or librarians are not promoting the use of the Internet. To this end, it is suggested that librarians should investigate further why the Internet is less used by the students in their libraries at KUST. For this purpose, the librarians should meet and inquire about the students in the training sessions or should visit their classrooms to ask them about their priority of the use of the Internet that may be provided in the libraries. Ullah Mr, S., Jan Dr, S., Sohail Dr, A., & Jan Mr, M. Y. (2021) reported that the Graduates of Post Graduate Medical Institute (PGMI) Peshawar use internet at their homes where as one fourth of the respondents use internet at the library. The areas like internet café and computer centers are not in the priority list of Post Graduate Trainees of PGMI Peshawar.

The students at KUST were asked to elaborate the purpose of using the library. The results showed that students in the KUST ranked entertainment as the 1<sup>st</sup> priority, social media as the 2<sup>nd</sup> priority, and sports as the 3<sup>rd</sup> option. However, the interesting results are that only three students indicate the usability of the Internet for searching and retrieval of library digital services. Further, these students have ranked the use of the Internet at the library as the 7<sup>th</sup> option. Likewise, the use of the internet for the job was ranked the lowest level. According to Fatema *et al.* (2020), the Internet is usually used at the central library and computer labs by university students for the retrieval of information resources related to their educational, learning, and research needs. The results showed that students in the KUST ranked entertainment as the 1<sup>st</sup> priority, social media as the 2<sup>nd</sup> priority, and sports as the 3<sup>rd</sup> option while using the internet. Likewise, Ahmad and Rafiq (2016) stated students use the internet for entertainment instead of educational activities. Moreover, Manzoor (2014) reported that students prefer to adopt the Internet for research and other academic projects. Similarly, Sheikh *et al.* (2013) indicated that students prefer to use the Internet at the University of Peshawar with the intention to finish their work quickly.

From the analysis of data, it was also revealed that majority of the students are not satisfied with the quality, speed, availability, and access to the Internet at the KUST. Non-availability of

electricity, low internet speed and affordability by the students were ranked as the major barriers to the use of internet at Kohat university of Science and Technology. Similarly, Ullah Mr, S., Jan Dr, S., Sohail Dr, A., & Jan Mr, M. Y. (2021) and Siraj *et al.* (2015) pointed the same obstacles to the productive use of internet at educational institutions in Pakistan. Higher Education Commission of Pakistan and provincial Education departments should have to focus attention on the extermination of these barriers to the effective usage of internet in Pakistan.

### Conclusion

Keeping in view the results of the study and the discussion, it concludes that the majority of the students at KUST have the ability to utilize the Internet. They are using different tools for the use of the Internet to accomplish their different education, informational and personal needs. It is also identified that students prefer to use the Internet at their hostel. Further, students at KUST indicated the library as the less preferable platform for Internet utilization. However, it is further validated that students in the KUST use the Internet for mostly entertainment on their cell phones. While using the Internet at KUST the students reported the unavailability of electricity as one of the principal barriers in the use of the Internet. Overall, the students in the KUST are not satisfied with the quality of the Internet. The authorities may attempt to eliminate all these barriers to enhance the quality of the Internet and thus further may enhance the student's level of satisfaction. Then enhancement of the internet is necessary to facilitate the students in the adequate timely utilization of the Internet.

### Recommendations and Suggestions

The findings of this study could have several significant recommendations. However, keeping in view the objectives and scope of the study, the below recommendations are outlined.

- 1) The university authorities should focus on the enhancement of the Internet at KUST.
- 2) The librarians should come forward to motivate students toward the educational usage of the Internet.
- 3) The students should be informed about the ways to use the Internet for academic purposes.
- 4) The university librarians are expected to frame a policy model to enhance the level of students' adequate and educational utilization of the Internet that may further enable them to cope with modern professional challenges.
- 5) Different departments may teach the students at KUST how to use the Internet pertinently with the intention to utilize their precious time and promote their academic performance.
- 6) The classroom and research activities must be made Internet-based.
- 7) For researchers and other students, the learning of Internet usability should be mandatory to enable them as independent researchers.
- 8) Further, the university authorities, librarians, IT departments, and departmental heads should collaborate to organize different training programs and workshops for the students at KUST to learn the use of Internet-based research, accomplish their educational and research needs through the Internet, and avoid the negative use of the Internet.

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