Accessibility and Usability of Internet Among University Students in Khyber Pakhtunkhwa, Pakistan

Shehzad Ahmad
Edwardes College Peshawar, Pakistan
Email: shehzad_ecp@yahoo.com

Muhammad Rafiq
University of the Punjab, Lahore, Pakistan
Email: dr.rafiqm@gmail.com

This study aims to investigate the internet accessibility and usability among the graduate students in the Public Sector Universities of Khyber Pakhtunkhwa, Pakistan. The study adopts a descriptive survey design. The data was collected by administering a structured questionnaire as data collection tool from 1001 graduate students, selected through proportionate sampling technique from the five purposefully selected Public Sector Universities in Khyber Pakhtunkhwa. The results revealed that, majority of the students have their own PCs/Lap-tops and accessed internet at homes followed by university libraries and computer labs mostly for: entertainment, academics, communication and keeping themselves up-to-date. However, majority of the students used to spend maximum time on internet for entertainment purposes rather than educational purpose. It was also revealed that they were less satisfied with some of the important academic online resources like: free books, free online databases, free electronic reference material, indexes and abstracts, and thesis and dissertations and that is why these resources received the lowest ranks in effectiveness and a very low rank in the use frequency. The problems which hindered the effective use of internet among students were: inadequate knowledge of online e-resources, slow speed of internet, electricity shortage problems, the negative attitude of society towards the internet usage, and students having less encouragement from parents to use internet due to the availability of immoral sites on the internet. Thus, overcoming these problems will definitely enhance the effective use of the internet. Suggestions and recommendations are proffered based on the findings of this study.

Keywords: Internet accessibility; internet use; university students; barriers in the use of internet.

Introduction

In modern technologies, internet is excessively used by people in many ways for variety of purposes including entertainment, communication, and education. Internet as an essential universal source to retrieve and disseminate information helps students to broaden their educational experiences (Tella, 2007). Features of the internet that have affected the quality of education mainly are: accuracy, comprehensiveness and time saving (Brown and Adler, 2008). Schonfeld & Guthrie (2007) believed that it is impossible to achieve excellence in education without internet use. The use of internet facilities in academic institutions is creating a new environment worldwide. Keeping in view the significance of modern technology, Higher Educational Institutions heavily invested in information technology during the last two decades that has a great impact on student's learning (Youssef and Dahmani, 2008). In advanced education system countries' students are trained about the use of internet and its facilities from the beginning through lectures, seminars, workshops and web-based tutorials to assist them in use of internet resources (Luambano and Nawe, 2004).

The Government of Pakistan is also playing an enthusiastic role in spreading the internet technology

in the country. Higher Education Commission through its Pakistan Educational and Research Network projects PERN-I and PERN-II provides high speed internet facilities to about 150 research and academic institutions (Higher Education Commission, 2012). These growing internet facilities in universities have changed the learning processes of the students (Khan, Khan and Bhatti, 2011). Akram (2014) revealed that the recent launch of 3G and 4G technologies in Pakistan have initiated a new phenomenon of mobile internet usage among students. And in a survey conducted by Pakistan Digital Consumer Study, 45% of the internet users are adopting mobile internet because of the decrease in smart phones prices and unreliable electric supply (Web Desk, 2013).

Due to these facilities, university students can now use free internet facilities in their departments, hostels, computer labs, and in libraries. Furthermore, the objective of the current Prime Minister Laptop Schemes to provide free Lap-tops to students is an attempt to encourage and enhance the scope of accessibility and usability of information in the field of education and research in the country (Higher Education Commission, 2012a). In addition, different multinational telecom industries in Pakistan, for example, WorldCall, Wateen, Wi-Tribe, are providing a variety of internet packages at nominal charges ranging from 500-1500 and 1500 to 3000 per month for internet connectivity to internet users in Pakistan. Moreover, the different mobile companies: Telenor, Ufone, Mobillink, Zong, and Warid Pakistan, are also providing the easiest mobile internet facilities to students.

All these efforts, of providing internet to the university students throughout the country particularly, in Khyber Pakhtunkhwa are commendable but it is very important to investigate the internet usage of the university students, because, libraries are mainly responsible for providing all kinds of information resources in whatsoever formats i.e., books, non-books and electronic/digital. At the same time it is imperative that users' internet use patterns must be studied together with library usage activities.This study is an attempt to assess the student's internet accessibility as well as usability to develop and improve more the library operations and systems.

Literature Review

Internet technology is gaining a significant growth in terms of access, usage and utility in the economic and social development of the world. Its use has become an essential part of resource consumption and service delivery, education, business, and entertainment, across the world. Uzunboylu (2004) stated that over the last few decades internet technology among the modern technologies is excessively used by people in many ways for a variety of purposes including entertainment, education, and information retrieval and communication. Tella (2007) is of the opinion that on one hand it facilitates users to connect to the geographically dispersed people by reducing the cost and on other hand it provides information through a massive collection of World Wide Web pages. Many studies have been conducted on the access and use of the internet by the students' community. Some of these studies have reviewed in the below paragraphs.

In 2008, Jones, et al., investigated the perceptions of students regarding the use of internet. He found positive attitude of students towards internet and were found satisfied with its use for academic activities. A year later Guan and Subrahmanyam (2009) studied the internet risks as well as opportunities for students. The risks were: internet addiction, bullying, and solicitation. He suggested conducting more research in future on this topic in order to protect youth from these negative aspects. Despite the enlisted risks, internet has positive aspects as well. It is a tool of learning and empowerment for youth. Similarly, Park (2009) and Zakaria, Watson and Edwards (2010) stated that internet has so many functions. Those are: information retrieval, communication, entertainment, and social interaction especially in higher education. Aslanido and Menexes (2008) conducted a study on the use of internet by students in four Greek cities. The researchers surprisingly found that students' use of internet for academic purposes was very low. The same observation was made by Shen and Shakir (2009) in their study of Arab students in UAE. Similarly, Dange (2010) expressed that student at KUVEMP used internet without getting any training because they mostly owned computers at homes and they were given computer and internet use training before

reaching to this level. It helps them to search and acquire their relevant information by themselves instead asking to others.

Tutkun (2011) discovered that most of the students access and use internet for their educational activities. The level of sharing knowledge was also high among the students in learning processes. The study also revealed that females were more sensible than male in their use of internet for educational activities. Khan, Khan & Bhatti (2011) also found that students use internet mainly for academic purpose. The hurdles in the use of the internet were: improper provision of the internet, slow speed, and inadequate PCs in computer labs. In another key study, Khan, Bhatti and Khan (2011) revealed that majority of the students using the internet were female, having 20-25 years of age facing the only hurdle that was lack of time. Yousaf (2012) analyzed the negative and positive effects of internet on the youngsters in Gujarat city. He pointed out that most of the parents being illiterate, did not know the causes of the misuse of internet and complained about their children unsatisfactory performance in education. Therefore he suggested that the authorities should devise policies, rules, and regulations to educate students for the proper and effective use of the internet. Furthermore, sometimes students are unable to get the relevant information due to the lack of information searching skills. The study recommended developing proper guidance and counseling centers to educate students regarding the positive use of internet which will bring significant improvement in their learning attitude. In the same year, Devi and Roy (2012) studied the internet use of students at Assam University, India. He found that students primarily use internet 80% for educational purposes, 5% each for entertainment and searching jobs, while 3% for online shopping. In the light of these results researchers suggested to start awareness programs for students to maximize the use of internet.

Adekunmisi, Ajala and Iyoro (2013) revealed that the provision of inadequate internet facilities on campus compelled university students to visit internet cafes run by private owners for economic gains. Researcher also found that (91.5%) students were internet literate and browse internet regularly for educational purposes. But, the problems they encountered were: inadequate browsing skills, high cost of internet, information overload, inadequate cybercafés, frequent power outrage and slow internet speed. The researchers recommended that the university management should equip the university central library and departmental libraries with internet facilities, train the library staff to assist students in the use of internet, provide computers with modern specification, extend the timings for internet services, cost for internet and printing should be reduced keeping in view the affordability of the students, solve slow connectivity problem, and to stop immoral sites. Chhacher, Khuskh and Chacher (2013) and Kassangoye, Jager, Rugimbana (2013) indicated that maximum number of students used internet for entertainment purposes. Only 12% students used it for educational purposes. Furthermore, students spend maximum time on using Facebook. Among search engines Google was the most popular for searching information. The only issue identified during research was students having no information about plagiarism. Students often cut and paste material and never give references from where they get information. Therefore, researcher suggested that students must be aware about the proper use of information and internet. These findings are similar to the findings of the study conducted in 2013 by Bhatti and Amjad. Among other findings, it was found that students learned the use of internet from their teachers as there was no trained staff in computer labs. Furthermore, it was recommended to the Government and universities authorities to develop policies like, usage, training policy and provide modern internet facilities on campus to insure the internet accessibility to maximum students as they are not able to pay the internet charges in private net cafés.Similarly, Bola and Ogunlade (2012) did a survey of graduate students in university of Lagos, Nigeria concerning the accessibility and usability of Internet facilities by the university students. They found that most of the students' internet use place was cybercafés. Students further highlighted that the motivating factor for using internet is their belief that internet provides them with valid information.Therefore, they use it mainly for the acquisition of information for assignments, literature review, course related material, and for social interaction.

Thus it is concluded from the literature that the student's main motivations behind the use of the internet were: ease of its use and accessibility and availability of educational material and usefulness and satisfaction of the online material on the internet. Thus the researchers believe that such studies should be conducted because it helps in improving the effective and efficient use of the internet facilities among students community.

Objectives

This research is planned to meet the following research objectives:

1. To find out internet access points of the university students.
2. To determine internet usage patterns of the university students.
3. To find barriers that students face in the use of internet.

Methodology

To achieve the objectives of research, quantitative research design is chosen in which survey questionnaire is used to collect the data. The data collection instrument was consisted of three sections. The first section contains questions related to the background information, second asked questions for internet access and use patterns. And the last part three dealt with the barriers students faced in the use of internet. Survey method is a very useful way to study the characteristic of a large population, geographically dispersed by studying relatively small number selected from the larger group (Powell and Connaway, 2004).

The population of this study was all the graduate university students, studying in final year/final semester. Thus to select a representative sample of the population proportionate stratified sampling technique was used to determine the required sample. Furthermore, this method is also chosen for the reason that many previous studies (Anunobi & Mbagwu, 2009; Jones et.al., 2009; Rosen, Stefanone & Lackaff, 2010) had also used survey methodology successfully in such type of studies.

Data Analysis and Discussions

Response Rate

Out of 1001 distributed instruments, 696 participants replied which makes (69.5%) that was an excellent response rate. But, out of 696 responses some 23 questionnaires were found un-utilizable. Thus, the utilizable questionnaires were 673 (67.2%) out of 1001 that was still a good response rate.

Demographics Information

The respondent's distribution according to age, gender, programme of study, and ownership of PCs/Lap-tops are presented in (Table 1). The respondent's distribution in different age groups shows that a large majority (331. 49.1%) of the respondents both males and females belonged to the same age group 21-23 years. The second larger group (165, 24.5%) belonged to the age group 26-26 years. Smallest group was of 27+ years of age (22, 3.2%). Similarly, the gender wise distribution of the respondents shows that majority of them were males (424, 63%) while, (249, 36.9%) were females.

In the same way, their distribution in programmes of study shows that the number of students in Sciences faculties (348, 51.7%) was greater than the number of students in Arts/ Social Sciences (200, 29.7%). But, there was a less number (125, 18.5%) of students in the faculties of Management Sciences.

The data regarding the possession of personal computer by students revealed that the majority of students (414, 61.5%) possessed personal PCs/Lap-tops whereas, (259, 38.5%) did not possess personal PCs/Lap-tops. Furthermore, the number of males (73.1%) possessing personal PCs was higher than the females (41.8%). In the same way, the number of female students (58.2%) not possessing personal PCs was much higher than males (26.8%) without their personal PCs. The reasons for having personal PCs by a greater number of university students might be the affordable prices of PCs in the country or the Prime Minister intuitive of providing free Lap-tops scheme in the Public Sector Universities in Pakistan. But, a large population did not have personal PCs, should be a matter of concern for the authorities.

Table 1
Respondents' Age, Gender, Programme of Study, and Ownership of PCs/Lap-top

Age Group					
Gender	*Up to 20 years*	*21-23 years*	*24-26 years*	*27+ years*	*Total*
Male	92(21.6%)	211(49.7%)	104(24.5%)	17(4.0%)	424 (63.0%)
Female	73(29.3%)	120(48.1%)	51(20.4%)	5(2%)	249 (36.9%)
Total	*165(24.5%)*	*331(49.1%)*	*155(23.0%)*	*22(3.2%)*	673(100%)
Programme of Study					
	Sciences	*Arts/Social Sciences*		*Management Sciences*	
	348(51.7%)	200(29.7%)		125(18.5%)	
Ownership of PC/Lap-top					
Gender	*Yes*		*No*	*Total*	
Male	310(73.1%)		114(26.8%)	424(63.1%)	
Female	104(41.8%)		145(58.2%)	249(36.9%)	
Total	*414 (61.5%)*		*259(38.5%)*	*673(100%)*	

Internet use Places

The respondents were asked to highlight the internet use places. The figures in (Table 2) shows that the highest number of respondents (399, 59.2%) preferred to use internet at home, followed by the second preferred place, library where (332, 49.3%) respondents used the internet facilities. The third preferred place was university computer labs where (309, 45.9%) students used internet. These findings are in line with the finding of (Rhoades et al., 2007). Some (171, 25.4%) students showed that they go to internet cafes for using the internet and only (150, 22.2%) revealed that they used internet at their friends' houses. Apart from the above mentioned places some (201, 29.8%) students stated that they used internet in hostels and just only (7, 1.0%) students mentioned that they used internet in offices. This small group (1.0%) of the university students might be the same elder group above the age of 27 years who would be on job and thus using internet at their offices.

The reason for using internet at homes by majority of the respondents might be that they have internet facilities at homes and also possessed personal PCs therefore, maximum number of students used internet at homes. Same was reported by Dange (2010) in his research. Another reason might be that, they don't have enough time to use internet at their concerned campuses due to the tight class's schedules. Similarly, respondents mentioned that libraries and computer labs were easy places to access and use internet. Students had enough internet facilities at homes, libraries, and computer labs therefore, less preferred internet cafes' and friends' houses.

Table 2
Respondents' Internet Use Place (Multiple Answers Question)

Internet use place	***Frequency***	***Percentage***
Home	399	59.2%
Friends house	150	22.2%
University computer lab	309	45.9%
Library	332	49.3%
Internet Café	171	25.4%
Hostel	201	29.8%
Office	7	1.0%

Students Internet Use Purposes

The respondents were asked to indicate the level of their agreement with each purpose for which they used internet. The mean scores and standard deviations derived for each purpose of internet use are presented in (Table 3). It shows that respondents were agreed with the highest mean scores that they use internet for the following four purposes: use of Social Networking Sites e.g. Facebook, Myspace, Meet me,…etc. (mean, 4.10), Complete assignments/research projects (mean, 4.07), E-mail (mean, 4.02), and Chat with friends and family members (mean, 3.99). Similarly, a number of studies (Basir, Mehmood, and Shafiq 2008; Arthur and Brafi 201; Bankole 2012; Bola and Ogunlade 2012; Lebnon Hawi 2012; Fasae and Alaadeniye 2012; Bhatti and Amjad 2013) had also founded that students basically use internet for three main purposes: education followed by research work and entertainment. On the other hand, the studies conducted by Chhacher, Khuskh and Chacher (2013) and Kassangoye, Jager, Rugimbana (2013) had founded that maximum number of students did not use internet for education purposes but, for using Social Networking, and entertainment.

The data further indicates that students also expressed their agreement, with mean score greater than 3.50, that they use internet for searching admission and scholarships (mean, 3.96), read e-newspapers and general magazines (mean, 3.89), watching movies/dramas/shows/photographs (mean, 3.81), downloading software (mean, 3.80), watching and listening music (Audio/Visual) (mean, 3.67), and watching sports (mean, 3.59).

So far the internet use purposes: playing games (mean, 3.43), chatting with the purpose to communicate academic information with teachers/supervisors/colleagues (mean, 3.34), search for job (mean, 3.12), spend leisure time (mean, 2.87), see weather reports (mean, 2.85), use online shopping and trading websites (mean, 2.84), and were concerned, students

Table 3
Students' Internet Use Purposes

	Purposes of internet use	***Mean***	***SD***
1	Use Social Networking Sites (Facebook, Myspace, Meet me… etc.)	4.10	.835
2	Complete assignments/research projects (download and consult free academic e-resources: e-books/journal's articles/thesis and dissertations/manuscripts/technical reports/ indexes and abstracts etc.)	4.07	.794
3	E-mail	4.02	.763
4	Chat with friends and family members	3.99	.914
5	To search for admissions and scholarships	3.96	.931
6	Read e-newspapers and general magazines	3.89	.953
7	Watching movies/dramas/shows/photographs	3.81	1.027
8	Download software	3.80	1.014
9	Watching and listening music (Audio Visual)	3.67	1.097
10	Watching sports	3.59	1.254
11	Playing games	3.43	1.278
12	Chatting with the purpose to communicate academic information with teachers/supervisors/colleagues	3.34	1.141
13	Search for jobs	3.12	1.137
14	Spend leisure time	2.87	1.201
15	See weather reports	2.85	1.192
16	Use on-line shopping and trading websites	2.84	1.100

Note. Strongly disagree=1; Disagree=2; No opinion=3; Agree=4; Strongly agree=5

showed no opinion. The reasons for giving no opinion about some of the internet resources might be the less frequent use and unfamiliarity of those resources among students.

It is important that the participants showed agreement with the maximum mentioned purposes of internet usage at various levels and expressed no opinion about a very few. The above results are also in line with Devi and Roy (2012) results, indicating that the students used internet mainly for educational purposes but very few used it for shopping, searching jobs, and entertainment.

Students Time Spent on Internet for Different Purposes

This question deals with the purposes for which university students use internet related to their educational, entertainment, and social needs. It also covers time spent on these purposes. Time spent by individuals on various internet purposes is a good indicator of their online information use. The related data in terms of hours per week is presented in (Table 4). The figures show that a large number (192) of the respondents spent maximum time 10-12h per week on watching movies/dramas/shows/photographs only. Similarly, majority of the students were quite busy by spending much of their time 7-9 h/w on the internet for completing assignments/research projects (download and consult free academic e-resources: e-books/journal's articles/thesis and dissertations/manuscripts/technical reports/ indexes and abstracts etc.), using SNSs, and reading e-newspapers and general magazines. These results are similar with Coniglio, et al. (2012) research. But, contradictory with Chhacher, Khuskh and Chacher (2013) and Kassangoye, Jager, Rugimbana (2013) researches indicating that maximum number of students spent much of their time on internet for entertainment purposes, only 12% students used it for educational purposes.

The above results also indicate that they would spend little time 4-6h per week for the internet use purpose 'watching and listening music'. Respondents used to spend equal time 1-3h/w for the internet use purposes as followed: chatting with the purpose to communicate academic information with teachers/supervisors/colleagues, search for admission and scholarships, see weather reports, spend leisure time, search for jobs, watching sports, and playing games. Students spent minimum time only on the on-line shopping and trading websites. It means that students had lesser trends of using online shopping and trading websites.

The Effectiveness of Internet Resources and Activities

The participants were asked about the effectiveness of resources available on the internet. Their responses are provided in (Table 5). Participants considered the internet sources: e-mail (mean, 4.57), online movies/dramas/shows (mean, 4.57), search engines (mean, 4.56), very effective whereas they expressed that HEC digital library databases (mean, 4.45), online chat (mean, 4.28), free software (mean, 4.20), more than effective. The internet sources which rated effective or nearly effective were: electronic encyclopedia, dictionaries and other electronic reference material (mean, 4.03), e-news papers and magazines (mean, 4.03), SNSs (mean, 4.00), free online databases to download information (mean, 3.98), sports (mean, 3.95), and online music (mean, 3.92), audio visual resources (mean, 3.84), photographs and images (mean, 3.83), using blogs, wikis, RSS and Tumblr's (mean, 3.80), and research papers delivered in seminars, conferences and workshops (mean, 3.66). Hopefully, these internet resources would be used frequently by respondents to satisfy their educational and other social needs.

The respondents did not clearly state any of the internet resource and activity as ineffective. However, about some of the internet sources they did not give any response on the positive or the negative side. These included: free books (mean, 3.26), electronic thesis and dissertations (mean, 3.24), technical reports (mean, 3.15), presentations available on slide share (mean, 3.11), online cloud storage (sky drive, Google drive, One drive…etc) (mean, 3.06), and indexes and abstracts (mean, 3.01). Giving no comments about the effectiveness or ineffectiveness of these resources by the students might be that students would not satisfied with these or not well aware of these resources. In this situation the authorities need to develop the marketing strategies regarding eresources

Table 4
Students Time Spent on Internet for Different Purposes

	Internet use purposes	***1***	***2***	***3***	***4***	***5***	***6***
1	Complete assignments/research projects (download and consult free academic e-resources: e-books/journal's articles/thesis and dissertations/manuscripts/technical reports/ indexes and abstracts etc.)	0	149	144	**220**	154	6
2	Download software	30	218	210	196	19	0
3	E-mail	12	278	241	123	19	0
4	Chatting with the purpose to communicate academic information with teachers/supervisors/colleagues	165	282	180	26	8	12
5	To search for admissions and scholarships	113	303	167	62	14	14
6	Use Social Networking Sites (Facebook, Myspace, Meet me… etc.)	6	117	149	198	157	46
7	Read e-newspapers and general magazines	37	124	156	217	113	26
8	Chat with friends and family members	156	276	147	54	28	12
9	See weather reports	248	256	143	23	3	0
10	Spend leisure time	221	255	164	26	6	1
11	Search for jobs	211	242	150	51	9	10
12	Use on-line shopping and trading websites	254	234	164	19	2	0
13	Watching movies/dramas/shows/photographs	32	161	128	146	192	14
14	Watching and listening music (Audio Visual)	77	146	222	162	51	15
15	Watching sports	106	186	176	124	61	20
16	Playing games	144	188	171	100	52	18

Note. 0hr=1; 1-3hrs=2; 4-6hrs=3; 7-9hrs=4; 10-12hrs=5; and 12+hrs=6

In nutshell, if a scale of one for 'very ineffective' to five for 'very effective' was used, then the mean score was 3.84. This would place the internet resources on the effective side which is very satisfactory.

Students Use Frequency of Internet Resources and Activities

The use frequencies of different internet resources and activities by the participants are presented in (Table 6). It revealed that free software (mean, 4.65), online chat (mean, 4.57), HEC digital library databases (mean, 4.56), and search engines (mean, 4.52) were used very frequently than all other sources. Among other internet resources, SNSs (mean, 4.46), e-mail (mean, 4.39), speeches and lectures available on you tube (mean, 4.35), electronic encyclopedias, dictionaries, and other electronic reference material (mean, 4.26), audio-visual resources (mean, 4.08), e-news papers and magazines (mean, 4.06), photographs and images (mean, 4.04), online music (mean, 4.04), sports (mean, 3.93), and online movies/dramas/shows (mean, 3.71) were used frequently. Its frequent use shows that these were the major type of internet resources that students used for fulfilling their needs and its use might also be advised by their teachers/supervisors.

Some of the internet resources and activities such as, research papers delivered in seminars, conferences and workshops (mean, 3.23), electronic thesis and dissertations (mean, 2.99), free online database to download information (mean, 2.88), using RSS blogs, wikis, RSS and Tumblr's (mean, 2.86), free e-books (mean, 2.82), indexes and abstracts (mean, 2.80), presentation available on slide share (mean, 2.70), were occasionally used with much less frequency.. It is very surprising that students did not give much importance to technical reports (mean, 2.48) and

Table 5
The Effectiveness of Internet Resources and Activities

	Information resources and activities on the internet	***Mean***	***SD***
1	E-mailing	4.57	.539
2	Online movies/dramas/shows	4.57	.539
3	Search engines	4.56	.505
4	HEC Digital Library databases	4.45	.658
5	Online Chat	4.28	.120
6	Free software	4.20	.675
7	Speeches and lectures available on YouTube.com	4.03	.952
8	Electronic encyclopedias, dictionaries and other electronic reference material	4.03	.780
9	Electronic newspapers & magazines	4.01	.826
10	Social Networking Sites (SNS) (Facebook, Twitter… etc.)	4.00	.673
11	Free online databases to download information	3.98	.888
12	Sports	3.95	.890
13	Online music	3.92	1.121
14	Audio-visual resources	3.84	.937
15	Photographs and images	3.83	.932
16	Using blogs, wikis, RSS and tumblrs	3.80	.963
17	Research papers delivered in seminars, conferences and workshops	3.66	1.111
18	Free e-books	3.26	1.173
19	Electronic theses and dissertations	3.24	1.025
20	Technical reports	3.15	1.143
21	Presentations available on Slide-share	3.11	1.194
22	Online cloud storage (Sky drive, Google drive, One drive)	3.06	.971
23	Indexes and abstracts	3.01	1.021

Note. Very ineffective=1; Ineffective=2; No opinion=3; Effective=4; Very effective=5

online cloud storage (sky drive, Google drive, One drive…..etc.) (mean, 2.29). Does it mean that technical reports an important source and online cloud storage, an important preservation storage source for students, were rarely used by the concerned? The data in (Table 5) shows that respondents expressed no opinion about the effectiveness of the above occasionally or rarely used internet resources, which is a matter of concern and needs to investigate further. However, they consider, free online databases to download information, research papers delivered in seminars, conferences, and workshops, and using blogs, wikis, RSS and Tumblr's, effective (Table 5) but used these with low frequency (Table 6).

Students Level of satisfaction Obtained from the Use of Internet Resources and Activities

The data related to satisfaction obtained from with the use of internet resources and activities are presented in (Table 7). The respondents are very satisfied with the information received from internet through search engines (mean, 4.66), speeches and lectures available on you tube (mean, 4.61), E-mail (mean, 4.58),HEC Digital library databases (mean, 4.56), electronic encyclopedias , dictionaries and other electronic reference material (mean, 4.54), and SNSs (facebook, Twitter…etc.) (mean, 4.52). These sources received the highest ranks with almost the same levels for effectiveness (Table 5) and frequency of use (Table 6).

Table 6
Students Use Frequency of Internet Resources and Activities

	Information sources and activities available on the internet	***Mean***	***SD***
1	Free software	4.65	.513
2	Online Chat	4.57	.521
3	HEC Digital Library databases	4.56	.509
4	Search engines	4.52	.559
5	Social Networking Sites (SNS) (Facebook, Twitter… etc.)	4.46	.640
6	E-mailing	4.39	.762
7	Speeches and lectures available on YouTube	4.35	.705
8	Electronic encyclopedias, dictionaries and other electronic reference material	4.26	.798
9	Audio-visual resources	4.08	.934
10	Electronic newspapers & magazines	4.06	.830
11	Online music	4.04	.889
12	Photographs and images	4.04	.889
13	Sports	3.93	.988
14	Online movies/dramas/shows	3.71	1.006
15	Research papers delivered in seminars, conferences and workshops	3.23	1.149
16	Electronic theses and dissertations	2.99	1.224
17	Free online databases to download information	2.88	.902
18	Using blogs, wikis, RSS and tumblers	2.86	1.176
19	Free e-books	2.82	1.018
20	Indexes and abstracts	2.80	1.212
21	Presentations available on Slide-share	2.70	.870
22	Technical reports	2.48	1.110
23	Online cloud storage (Sky drive, Google drive, One drive)	2.29	1.080

Scale. Never=1; Rarely=2; Occasionally=3; Frequently=4; Very frequently=5

Satisfaction with the electronic newspapers and magazines (mean, 3.90) is higher than the online movies/dramas/shows (mean, 3.72), and online chat (mean, 3.71). The level of satisfaction from Audio-visual resources (mean, 3.66), free software (mean, 3.64), sports (mean, 3.63), and research papers delivered in seminars, conferences and workshops (mean, 3.62), are almost the same but not that high which should be a reason for concern. Similarly, same is the case with photographs and images (mean, 3.59) and online music (mean, 3.53) which received a little higher rank than free books (mean, 3.31), free online databases to download information (mean, 3.15), and electronic theses and dissertations (mean, 3.04). It is interesting that respondents not very satisfied from these resources even then they used some of these: free software, watching sports, listening online music, and watching photographs and images on frequent basis as indicated in (Table 6).

Surprisingly, the presentations available on slide share (mean, 2.97), indexes and abstracts (mean, 2.97), technical reports (mean, 2.75), blogs, wikis, RSS and Tumblr's (mean, 2.74), online cloud storage (Sky drive, Google drive, One drive) (mean, 2.73), received the lowest rank. . It may be pointed out that these resources also received the lowest rank in

Table 7
Students Level of Satisfaction Obtained from Internet Resources and Activities

	Information resources and activities on the internet	***Mean***	***SD***
1	Search engines	4.66	.476
2	Speeches and lectures available on YouTube	4.61	.542
3	E-mailing	4.58	.512
4	HEC Digital Library databases	4.56	.542
5	Electronic encyclopedias, dictionaries and other electronic reference material	4.54	.542
6	Social Networking Sites (SNS) (Facebook, Twitter… etc.)	4.52	.564
7	Electronic newspapers & magazines	3.90	.846
8	Online movies/dramas/shows	3.72	1.050
9	Online Chat	3.71	1.107
10	Audio-visual resources	3.66	1.056
11	Free software	3.64	1.058
12	Sports	3.63	1.104
13	Research papers delivered in seminars, conferences and workshops	3.62	1.116
14	Photographs and images	3.59	1.050
15	Online music	3.53	1.128
16	Free e-books	3.31	1.182
17	Free online databases to download information	3.15	1.068
18	Electronic theses and dissertations	3.04	1.168
19	Presentations available on Slide-share	2.97	1.140
20	Indexes and abstracts	2.97	1.126
21	Technical reports	2.75	.980
22	Using blogs, wikis, RSS and Tumblr's	2.74	1.185
23	Online cloud storage (Sky drive, Google drive, One drive)	2.73	1.098

Note. Very dissatisfied=1; Dissatisfied=2; No opinion=3; Satisfied=4; Very satisfied=5

effectiveness (Table 5) and a very low rank in the use frequency (Table 6). This situation needed to be investigated further.

Barriers Students Face in the Use of Internet

To answer the fifth research question a set of seventeen possible barriers that the researcher identified through literature which students generally faced while using the internet was given in the questionnaire and the respondents were asked to indicate the level of agreement with those barriers in their opinion. The participants' opinions on these barriers are presented in (Table 8). The results showed that inadequate knowledge of online e-resources with the highest mean score (mean, 3.96) was considered as nearly the most important barrier they agreed with, this finding was similar with the finding of Al-Saif (2009). The negative attitude of society towards the internet usage (mean, 3.87), less encouragement and restrictions from parents to use internet due to the availability of immoral sites on the internet (mean, 3.86), sexual harassment problems (mean, 3.79), slow speed of internet (mean, 3.57), and electricity shortage problems (mean, 3.57) were considered as important barriers. The last two problems were also identified and reported by Bankole (2012).

The problems which were nearly important for students were: lack of support from staff working in computer labs and library (mean, 3.40) as it was

Table 8
The Barriers Students Faced in the Use of Internet

	Barriers	***Mean***	***SD***
1	I lack adequate knowledge about online e-resources	3.96	2.174
2	The problem of negative attitude of society towards the internet usage	3.87	1.027
3	Students have less encouragement and restrictions from parents to use internet due to the availability of immoral sites on the internet	3.86	.969
4	I feel sexual harassment problems	3.79	2.468
5	Slow speed of internet (connectivity)	3.57	1.267
6	Electricity shortage problem	3.57	1.240
7	Lack of support from staff working in computer labs and library	3.40	1.314
8	Difficulty in using the internet due to distance between me and internet stations	3.40	1.226
9	I can't use internet due to insufficient time available to me because of my domestic responsibilities	3.34	1.282
10	Lack of (workstation) in computer labs/libraries to access internet	3.33	1.238
11	The problem of too much information to deal with	3.16	1.254
12	I face confidentiality and security issues in the use of internet	3.15	1.237
13	I can't afford the cost of internet	3.12	1.250
14	I lack information searching skills	3.06	1.279
15	I face language barrier in the use of internet	3.01	1.219
16	I feel nervousness/anxiety in using internet	2.83	1.373
17	I feel the computer anxiety (fear in the use of computer)	2.30	1.106

Note. Strongly disagree=1; Disagree=2; No opinion=3; Agree=4; Strongly agree=5

identified by Adekunmisi, Ajala and Iyoro in 2013, difficulty in using the internet due to distance between students and internet stations (mean, 3.40), insufficient time available to me to use the internet because of my domestic responsibilities (mean, 3.34) and lack of (workstation) in computer labs/libraries to access internet (mean, 3.33). The same problem was also identified by Ani in 2010, were also important to them. These findings were also found in line with Adekunmisi, Ajala, Iyoro (2013), Arthur and Brafi (2013).

The problems of too much information to deal with (mean, 3.16), confidentiality and security issues in the use of internet (mean, 3.15), cost of internet (mean, 3.12), and combined with lack of information searching skills (mean, 3.06) were also worrying to them. Adekunmisi, Ajala and Iyoro (2013), has also identified the same problems of high cost of internet and lack of information searching skills that should be a cause of concern for the authorities.

The language barrier in the use of internet (mean, 3.01,) anxiety in using internet (mean, 2.83) and computer anxiety (mean, 2.30), were least important problem to the participants which is a very good sign.

Conclusions and Recommendations

Based on findings of the study, following conclusions are drawn:

From the results it is inferred that the majority (61.5%) of the respondents possessed personal computers, either because of the Prime Minister free Lap-top scheme in the Public Sector universities in Pakistan or due to the affordable prices of computers/lap-tops in Pakistan. But, students (256, 38.5%) not possessing personal PCs is a matter of concern.It is therefore, recommended to continue the current Prime Minister free Lap-tops Scheme for students in the Public Sector Universities and the universities authorities and HEC

should also facilitate students by providing loans with easy installments. Similarly, the reason of using internet at home by the maximum number of students might be due to the provision of internet facilities everywhere particularly at homes by the government of Pakistan and the private ISPs in the country. Majority of the students preferred to use and access internet facilities at homes, libraries, and computer labs, and that is why, researcher recommends improving further the internet facilities for easy access at these places. It may also increase their use frequency of internet resources and satisfaction too, with the on-line educational resources. Improving the internet accessibility and usability among the university students in KPK will ultimately enhance students' academic output.

The findings also show that majority of the students expressed that they used internet primarily for academics, communication, and social interaction purposes. Findings further revealed that students used internet for social networking, entertainment, and updating their knowledge. However, the maximum time they spend on internet for entertainment purposes only. Therefore, the researchers recommend that teachers should adopt teaching pedagogies that motivate students to incorporate educational internet resources in their studies. It may enhance the use of internet for academic purposes. In addition, it is recommended that students should be advised by the concerned teachers, supervisors, and parents to make the use of internet for academic purposes more than entertainment, communications, and social interaction purposes in order to boost their use frequency of the educational internet resources rather than non-academic internet resources. Similarly, students declared any of the internet resource as ineffective but, were silent about the effectiveness of some very important educational internet resources like: free books, technical reports, electronic thesis and dissertations, indexes and abstracts, presentations available on slide share, online cloud storage (sky drive, Google drive, One drive…etc). Therefore, respondents should be familiarized with the internet resources and activities through effective marketing strategies, because the less effectiveness and low usage frequency of internet resources pointed towards the lack of marketing strategies of the internet resources. In the same way, a better qualified and supporting staff in libraries and computer labs with appropriate training in certain critical areas will also enhance the utility of internet resources and activities among university students in the public sector universities of KPK.

The university students used the internet resources on frequent basis, which they considered as effective and were highly satisfied with. However, they were less satisfied with some of the very important educational internet resources and activities which they used occasionally or rarely e.g. papers delivered in seminars, conferences and workshops, electronic thesis and dissertations, free books, free online databases, indexes and abstracts, presentation available on slide share, technical reports, Online cloud storage (Sky drive, Google drive, One drive), and using blogs, wikis, RSS and Tumblrs etc. Students did not express opinion about the effectiveness or ineffectiveness of these resources. It is therefore suggested, to investigate the reasons for low satisfaction with these resources and to take measures for enhancing students' level of satisfaction with these resources, that in-turn will definitely increase the use of the above internet resources.

In the main problems identified related to the internet usages of the university students in KPK, it is already recommended that, students' inadequate knowledge of online resources should be solved through proper marketing strategies, the negative attitude of the society towards internet usage should be changed into positive through effective media programmes. In addition, rules, regulations and policies can be devised to block the immoral sites available on the internet. Furthermore, the HEC and the universities authorities should solve the problems of slow speed of the internet and the frequent power breakages by installing alternative power supplies. For solving the distance problems it is recommended that students should be provided easy access to computer and internet facilities at the department's computer labs, libraries, hostels, and even homes. It may eliminate female student's distance problem in using the internet and their computer anxiety as well. Furthermore, the rest of the problems mentioned in

the findings should also be considered by the concerned authorities for smooth and effective use of internet by the university students.

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