University Students' Readiness towards Mobile Learning: The Stages of Change Model

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Information seeking modes are changing rapidly due to advancements in portable devices such as smartphones. The functionality of smartphones is helping individuals to enhance their online learning experiences. The study was conducted to assess the readiness level among students towards the adoption of mobile learning at The Islamia University of Bahawalpur. A survey method of research was used to collect data for this study. A self-administered questionnaire was distributed through convenience sampling among the enrolled students of The Islamia University of Bahawalpur. Of the 183 respondents, the majority of 118 (64.5%) were female. Overwhelming, 170 (92.9%) respondents' usage frequency was 'daily' for accessing information through mobile. Stages of change model indicated that most of the respondents were at the 'maintenance stage' indicating that they were regularly using mobile for learning. The main barriers to mobile learning included: 'mobile learning causes sore eyes', and 'mobile screen size makes it difficult to concentrate on contents. The study concluded that a high level of readiness exists among students towards adopting mobile learning as they are regularly using smartphones to access the information from online resources to fulfill the requirements of formal learning. A statistically significant difference was found in the readiness level as female students are more likely to adopt m-learning than male students. The study's findings are useful for librarians, faculty members, IT experts, and policymakers of the participating

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university in designing mobile-related services for students to enhance learning communications and collaborations.

Keywords: Mobile learning; online learning; readiness; stages of change model; Mobile adoption.

INTRODUCTION

Among all other technologies, smartphone or cell phone technology has a dominant place in our society due to its portability and ubiquitous access. It becomes the need of every individual, especially youngsters, to access information using mobile devices. According to the Mobile Statistics Report of USA (2018), the number of mobile devices increased from 2014 to 2018 from 7.7 billion to over 12.1 billion. However, they predicted that mobile phone users would exceed from 5.6 billion to 6.2 billion by the end of 2018. Pakistan Telecommunication Authority (2020) reported 167 million cellular subscribers, 81 million 3G and 4G subscribers, 83 million broadband subscribers, and 3 million basic telephony subscribers (1.16%) in the country. These devices also support how informal education is progressing around the world by helping individuals learn innovatively and access high-quality information resources through a wireless network.

The topic of mobile learning is catching researchers' attention for the past few years due to its popularity and demand in all spheres of life. The definition of mobile learning can be categorized into four groups as (i) technological adoption such as smartphones, PDA's and mobile devices, (ii) the extension of e-learning, (iii) support formal teaching and learning, and (iv) based on the need of the learners (Sharples, 2007). M-learning helps boost learners' capabilities from traditional context to digital context through the use of such devices to capture real-world information in multiple formats both in learning and workplaces (Wishart and Green, 2010).

Mobile learning, in other words, is online educational learning to access information from different resources such as eBooks, e-journals, audiobooks, YouTube educational videos, websites to supplement formal learning, i.e., lectures, course work, class assignments, and presentations, etc. The availability of web 2.0 tools on mobile devices helps learners have 24/7 virtual access to information (Borovik, 2011). Using a wireless technological tool such as mobile devices is a medium to access information of one's interest and communicating to others, and m-learning enabling learners to engage themselves in educational and research activities without facing the barrier of physical locations (Kukulsa, 2005). The act of

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convergence between new learning and the new technology is based on the "learner-centered activity" as new technologies facilitate individuals' adoption of lifelong learning opportunities (Sharples, Taylor and Vavoula, 2010).

In the 21st century students who engaged themselves in m-learning activities revealed better learning strategies and problem-solving techniques relating to their course work (Lai and Hwang, 2014). The popularity of smartphone technologies is because of their functionality, which helps people in multiple ways. The marketing efforts of mobile industries force manufacturers and developers to develop more and more innovative features (Hussein, Osman and Cronje, 2010).

Mobile learning is ubiquitous in higher education and an important venue for student-centered learning. In the future, it will create a significant learning environment related to information-rich communication and interaction, which will facilitate teachers as well as professionals to perform intellectually challenging activities towards classroom learning (Crawford, 2007). It is crucial to develop strategies, tools, and techniques to help students and researchers learn using mobile devices (Hwang and Cheng, 2011).

To support learning, mobile devices' developers should consider the design challenges relating to the interface, which should be transparent and user-friendly. Secondly, screen design should be graphically supportive and mobile applications should base on educational and instructional designs (Hunaiyyan, 2000).

Students in higher education sectors are usually aware of smartphone usage for learning, but the need is to assess their readiness towards mobile learning. Therefore, this study was conducted to identify the readiness level for mobile learning among students using the stages of change model. Mobile technologies seem to be dominant everywhere in Pakistan's higher education sectors because youngsters are addicted to using their smartphones in routine life to communicate, collaborate, access online information with cellular services (2G, 3G, and 4G) or Internet connections. The availability of digital content, mobile-oriented library resources, and services are accessible via the Internet, helping individuals to fulfill required information need on just a few clicks of their smartphone's touchpad.

In the university environment, mobile learning is gaining popularity; the need is to measure readiness towards m-learning. Readiness is defined as "the state or quality of being ready; preparation; promptness; aptitude; willingness. Prepared for what one is about to do or experience; equipped or supplied with what is needed for some act or event; prepared for immediate movement or action" (Phillips, Turnbull and He, 2010).

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Most studies relating to mobile learning based upon the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Ajzen, 2002; Iqbal and Bhatti, 2012). However, our study measures readiness through the stages of change model to explore mobile learning's behavioral process. Readiness will help identify effective or ineffective use of mobile devices for learning. In an under-developed country like Pakistan, the requirement is to take implications towards smartphone technologies' positive usage to supplement formal education.

Objectives of the Study

The study is carried out to achieve the following objectives;

- To measure the readiness level among students towards the adoption of mobile learning at The Islamia University of Bahawalpur.
- To identify the research and educational purposes of using a smartphone.
- To investigate the perception of the students towards mobile learning.
- To identify the problem faced by the students while learning through mobile.

Research Questions

The study attempts to answer the following research questions;

- What is the level of readiness among students towards mobile learning (e.g., Pre-contemplation, Contemplation, Preparation, Action, Maintenance, and relapse) at The Islamia University of Bahawalpur
- What are the research and education purposes of using smartphones?
- What is the perception of the students about mobile learning?
- What are the barriers faced by students while learning through mobile?

LITERATURE REVIEW

The relevant literature on the topic has been searched using keywords i.e., m-learning, readiness, stages of change model, and mobile-phone adoption to retrieve data from subscribed databases of HEC Digital Library, i.e., ScienceDirect, SpringerLink, Tylor and Francis, Web of Science, and Summon 2.0.

International Literature

A study carried out during the Covid-19 pandemic by Biswas, Roy, and Roy (2020) highlighted that mobile learning has proved to be the most effective tool to fulfill the educational gap during the Covid-19 lockdown. Data collected through questionnaires from students of different universities of Bangladesh showed a

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positive perception about mobile learning. Students are also found familiar with the educational use of social media tools. The policymaker and educational institutions should consider the opportunity to incorporate mobile learning technology in the whole education system as it improves teaching and learning practices.

Glackin et al. (2014) claimed that mobile learning is a well-established tool to learn anytime, anywhere according to one's needs. Smartphone learning applications help students in developing subject-based knowledge and improve academic performance. Countries advanced in education, like the United Kingdom, USA, Australia, European countries, Malaysia, and Japan, use mobile learning in higher education and introduce e-libraries and e-books services through smartphone applications.

Gekas and Grant (2013) conducted a study to explore the implementation of mobile devices in higher education to support teaching and learning. Data gathered from three US universities revealed that students have a positive attitude towards using mobile phones for learning. They also identified mobile devices' advantages towards social interaction, collaboration, and usage of web 2.0 tools. An important theme that emerged through focus group discussion was the frustration of using mobile devices regarding their instructors' unwillingness towards the usage of technology in-class learning and a distraction in class due to the use of these devices.

Dashti and Aldashti (2015) identified female students' attitudes and perceptions towards undergraduate students' mobile learning usage. Results indicated that most of the respondents (80.3%) regularly use mobile for learning and believe that using mobile devices enhances their knowledge in terms of language and vocabulary. Wu *et al.*, (2012) conducted a meta-analysis study on mobile learning trends. They revealed that most survey studies on mobile learning from the year 2003 to 2010 focused on the effectiveness of mobile learning and the design system of mobile devices to support learning.

Nassuora (2012) examined the mobile learning acceptance by Saudi students of higher education and based the study on the model of "Unified Theory of Acceptance and Use of Technology" (UTAUT), which measured the factors that influence the intention of the students using mobile for learning. The study results revealed that the acceptance level of mobile learning among students was at a high level. Alhajri (2016) presented a case study on the students and instructors' perceptions of m-learning and challenges in implementing mobile learning in Kuwait. Survey data from 499 students and 110 instructors revealed that both

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students and instructors have a welcoming attitude and perception towards the adoption of m-learning. However, several challenges faced by the respondents were relating to technical design, institutional, management, pedagogical, cultural, and social challenges. Researchers suggested that policymakers in higher education should play a positive role in implementing m-learning to support teaching and learning.

Al-Fahad (2009) explored students' perceptions and attitudes towards mobile learning effectiveness at King Saud University, Riyadh. The study reported that activities of learning through mobile are enhancing the independent learning abilities among students. Students' main issues while learning through mobile where the cost of m-learning and the unavailability of the Internet. The study suggested that m-learning activities can be enhanced by reducing cost issues regarding ownership of these mobile technologies and access to information resources with an Internet connection.

National Literature

Hameed and Qayyum (2018) claimed that technological advancement is rapidly changing mobile phone technologies' role. Thus they measured the mediating factors influencing the adoption of mobile learning in Pakistan. Using a deductive approach, data were gathered from twin cities of Pakistan i.e. Rawalpindi and Islamabad. Six HEC recognized universities were selected randomly. Results showed a positive role of entertainment and informativeness on attitude and behavioral intention towards mobile learning.

Furthermore, irritation had a significant adverse effect on attitude and behavioral intention towards m-learning. Students feel irritated when they find information disorganized or irrelevant. Still, being a new phenomenon in Pakistan's current era, the study highlighted that they are not getting irritated while learning through portable devices. Students of higher education institutions are considering mobile learning as an appropriate learning mode. There is a strong and highly recommended need to use this technology to provide more learning opportunities in education by all academia stakeholders. Another study conducted at higher educational institutions of twin cities of Pakistan has shown that students are already equipped with the required facilities of m-learning. A large majority of the students are using educational mobile applications daily. Higher education institutions can make learning more pleasurable for their students to keep pace with the advancement of m-learning (Hassan *et al.,* 2015).

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Yousuf (2007) conducted a study to measure the effectiveness of mobile learning to support distance education. Survey data gathered through stratified sampling by selecting distance learners from five regional offices of Allama Iqbal Open University (AIOU) Pakistan. The majority (90%) of the respondents indicated that mobile learning greatly helps them distance learning to access information regarding assignments, course guides, workshops, and training schedules. The study suggested that AIOU concerned authorities should provide training sessions to utilize these devices in distance learning properly.

Iqbal and Bhatti (2015) investigated university students' readiness towards mobile learning using the Technology Acceptance Model (TAM). The data gathered through questionnaire from three private sector universities in Pakistan revealed that students' readiness was influenced by perceived ease of use (PEU) and perceived usefulness (PU). Both factors affected their behavior positively towards m-learning. The results of the study revealed that majority 74% of the respondents used text messages to communicate with other classmates to ask about class assignments, 60% used their smart smartphones to search and browse course information, 64% to read assignments, 48% to write assignments, 54% record videos and pictures for assignments and presentations.

Buksh, Mahmood, and Sengi (2015) conducted an explanatory study and measured the distance learners' readiness by assessing mobile devices' availability and affordability with cellular services (2G,3G & 4G), as well as willingness to adopt m-learning through online learning. Data gathered from enrolled students of Allama Iqbal Open University Pakistan (AIOU) revealed that willingness to adopt m-learning is high. Cellular services and mobile devices were affordable, as well. However, knowledge towards online learning or e-learning was at a moderate level. Similarly, Jan, Ullah, Ali, and Khan (2016) measured the effectiveness of m-learning at Abdul Wali Khan University, Marden, KPK Pakistan. Results revealed that students' attitude and perceptions towards the effectiveness of m-learning are encouraging. They believe that compared to e-learning devices such as computer, PCs & laptops, mobile devices are more supportive in terms of battery timing and overcome electricity issues, portability, and ubiquitous access.

The Stages of Change Model

The stages of change model (also called the Transtheoretical Model) developed in the late 1970s by Prochaska and DiClemente focuses on the individual's decision making, cognitive and intentional changes. The model assumes

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that people's behavior does not change quickly it usually takes time and gets changed in a cyclical process. According to the model, individuals move towards behavioral changes through six stages of change; pre-contemplation: at this stage, people are unmotivated and are not aware that they have problematic behavior, not intended to change behavior in the near future. Contemplation: at this stage individuals initially realize the need for change and thinking about taking steps in the foreseeable future to change their behavior. Action: at this stage individuals start taking some steps towards change and realize that change can lead them towards a better life. Stage of maintenance defines individuals' sustainable behavior, changed their behavior from negative to positive, and does not want to go back towards the stage of pre-contemplation. Relapse: this stage is rarely achieved; individuals usually want to stay at the "maintenance" stage; if they failed to do so, they do fall into the stage of relapse (Fig. 1) (DiClemente, Prochaska and Gibertini, 1985).

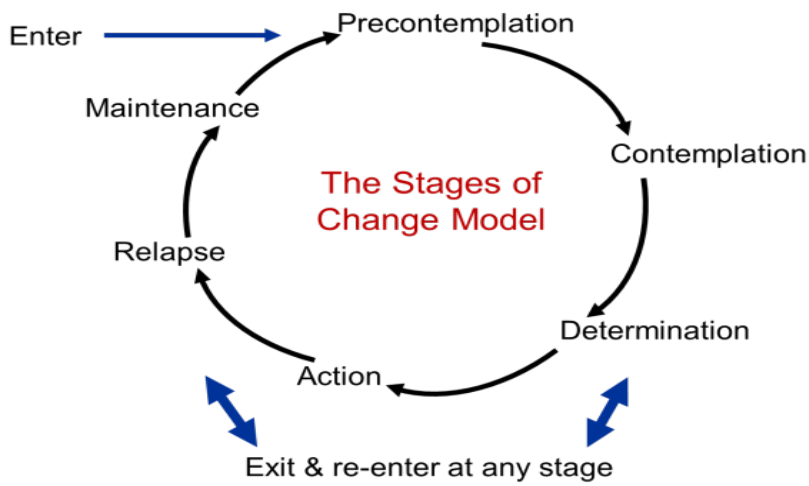

Figure 1. Stages of Change Model. Adapted from 'Self-efficacy and the stages of self-change of smoking,' by DiClemente, C. C., Prochaska, J. O., and Gibertini, M. 1985, *Cognitive therapy and Research, 9*(2), 181-200.

METHODOLOGY

A survey was conducted at the Islamia University of Bahawalpur. The population of the study comprised BS, Master, M. Phil, and Ph.D. students enrolled in the faculty of Arts, Faculty of Science, Faculty of Management Science, and

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Faculty of Pharmacy. A questionnaire was developed after conducting the relevant review of the literature and using the components of the stages of change model to determine the exact stage of readiness on which the population of the study exists in using mobile for learning (e.g., pre-contemplation, contemplation, preparation, action, maintenance, and relapse). Statements to measure readiness were 'I have yet to think about learning through mobile (Pre-contemplation). I have thought about learning through mobile but have not taken any steps yet (Contemplation). I have not used mobile for learning but have taken steps so that I will be able to use it soon (Preparation). I have used mobile for learning (Action). I regularly use mobile for learning (by searching required information from different databases and search engines) (Maintenance). I have used mobile for information access before, but not using it currently (Relapse).

The questionnaire comprised of four parts to gather data from the respondents, first part comprised questions relating to the demographic information of the respondents, the second part measured the usage frequency of smartphone, the third part comprised statements to identify the level of readiness, and part four contains questions relating to the perception towards mobile learning and problems faced while learning through mobile. The questionnaire was distributed among the respondents through convenience sampling. The questionnaire was pre-tested by two LIS professionals with more than 10 years of experience in library and information science, and it was pilot-tested on the first 10 responses. Overall, 350 copies of questionnaires were distributed among the respondents, of which 183 (52.28%) filled questionnaires were received and valid for data analysis. Chronbach's alpha was used for the reliability analysis of the questionnaire. The questionnaire was reliable with .904 score. The collected data analyzed using the Statistical Package for Social Science (SPSS v=20) and reported in descriptive and inferential statistics. The non-parametric statistical test Mann Whitney U was applied because the data collected for this study did not assume the basic assumption of the normal distribution for parametric statistics.

RESULTS

Of the 183 (100%) respondents, the majority of 118 (64.5%) were female. Most of the respondents 135 (73.8%) were aged between 21-25 years, while 33(18%) respondents' age was less than 20 years. The majority 91 (49.7%) of the respondents were enrolled in the master program. In terms of faculty, the majority of the respondents 96 (52.5%) were from the Faculty of Science, while 52(28.4%)

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were from the Faculty of Arts. Most 170(92.9%) of the respondents' usage frequency of smartphones was "daily". However, 49(26.8%) were using smartphones for more than 4 hours a day (Table 1, 2).

Table 1**.**

Demographic information of the respondents (n=183)

Gender of the respondents	Frequency	Percentage
Female	118	64.5%
Male	65	35.5%
Age of the respondents		
<20	33	18.0%
21-25	135	73.8%
26-30	9	4.9%
>30	6	3.3%
The education level of the respondent		
Graduate Program	43	23.5
Master Program	91	49.7%
Postgraduate Program	49	26.8%
Faculty of the respondents		
Faculty of Science	96	52.5%
Faculty of Arts	52	28.4%
Faculty of Management Science	19	10.4%
Faculty of Pharmacy	16	8.7%

Table 2.

Frequency of smartphone usage (n=183)

Values	Frequency	Percentage
Daily	170	92.9%
A few times a week	3	1.6%
Once a month	4	2.2%
Only when I need to	6	3.3%
Hours frequency of smartphone usage		
<1 Hour	34	18.6%
<2 Hours	27	14.8%
2-3 Hours	37	20.2%
3-4 Hours	33	18.0%
>4 Hours	49	26.8%

To measure the level of readiness, a set of 06 statements were asked to the respondents, all these statements based on the variables relating to the stages of change model (e. g., pre-contemplation, contemplation, preparation, action, maintenance, and relapse) towards the adoption of mobile learning. The majority of

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the respondents were at the stage of "maintenance" (M=4.58, SD=.909). Respondents frequently use their smartphones to access information. Respondents were found to "Agree" that they used mobile for learning at the stage of "Action" (M=3.62, SD=.981) (Table 3). Mann Whitney U test was applied to assess any difference between male and female students about their readiness for mobile learning. The p-value of the stage of "action", "maintenance", and "relapse" was lower than the significant level of 0.05, indicating that level of readiness towards mobile learning between males and females was significantly varies (Table 3).

Table 3.

Level of readiness among students (n=183)

Rank	Statements	Mean	SD	Mean Ranks		Mann Whitney U	P-value
				Male	Female		
1	I have yet to think about learning through mobile (Pre-contemplation)	1.43	.886	94.95	90.38	3643.500	0.432
2	I have thought about learning through mobile but have not taken any steps yet (Contemplation)	1.42	.904	89.14	93.58	3649.000	0.437
3	I have not used mobile for learning but have taken steps so that I will be able to use it soon (Preparation)	1.44	.929	91.29	92.39	3789.000	0.849
4	I have used mobile for learning (Action)	3.62	.981	107.15	83.66	2850.500	0.000
5	I regularly use mobile for learning (by searching required information from different databases and search engines) (Maintenance)	4.58	.909	83.55	96.65	3286.000	0.025
6	I have used mobile for information access before, but	1.46	.924	100.17	87.50	3304.000	0.041

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Rank	Statements	Mean	SD	Mean Ranks		Mann Whitney U	P-value
				Male	Female		
	not using it (currently preferring traditional sources e.g., books, periodicals, thesis, reports) (Relapse)						

Scale: 1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree, 5= Strongly Agree

The respondents were asked a question to indicate what do they prefer the most to access the information online. The majority of the respondents indicated that they prefer both mobile and laptop to seek information (Fig.2)

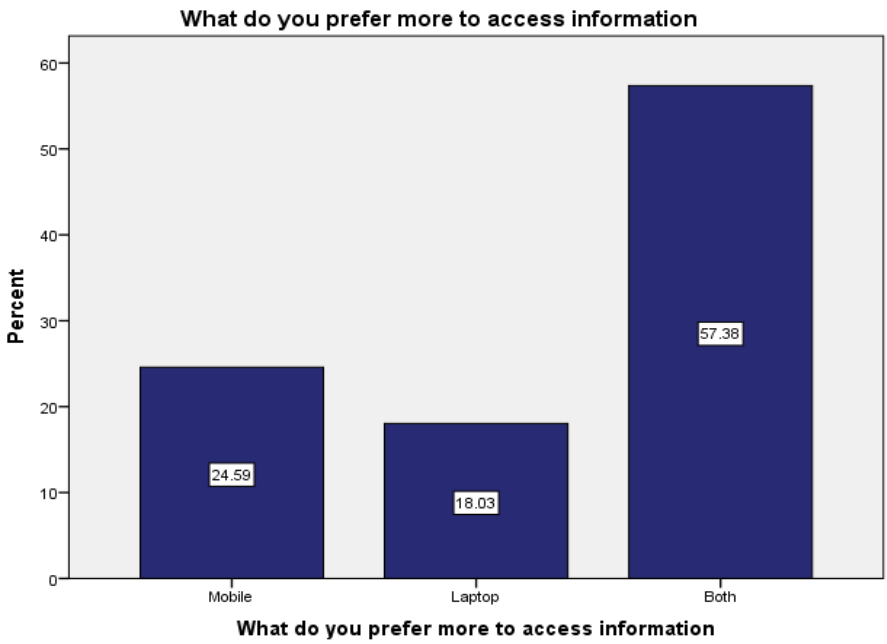

Figure 2. Preferred mode of information

The respondents were asked a set of 10 statements to identify their use of a smartphone for learning. Of the 10 statements, 01 received a mean score of 3.72, indicating that most of the respondents very often' use smartphones to search for information from different search engines (Google, Yahoo, and MSN, etc.). However, the rest of the statements received a mean score of around 3, indicating

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that majority of the respondents "sometimes" use a smartphone to send an email (M=3.27, SD= 1.190), to access educational/learning videos from YouTube or other sites (M=3.19, SD=1.201, p=.527) (Table. 4)

Mann Whitney U statistic was applied to assess any difference in the purpose of using a smartphone for learning between male and female respondents. Of the 10 items, only one item's P-value was lower than the significant level of 0.05, indicating that web search engines' usage to access information is significantly different between male and female respondents. However, in the rest of the statements, no significant difference was found (Table 4).

Table 4.

Purpose of using smartphone (n=183)

Rank	Statements	Mean	SD	Mean Rank		Mann Whitney U	P-value
				Male	Female		
1	To search for information from different search engines (Google, Yahoo, MSN etc.)	3.72	1.340	104.24	85.26	3039.500	0.015
2	To use email	3.27	1.190	96.45	89.45	3546.000	0.385
3	To access educational/ learning videos from YouTube or other sites	3.19	1.201	95.23	90.22	3625.000	0.527
4	To search for information from the library's online resources	3.18	1.198	94.15	90.82	3695.000	0.676
5	To search for references	3.08	1.171	92.95	91.47	3773.000	0.852
6	To search online repositories	3.03	1.266	94.14	90.82	3696.000	0.677
7	To find out online tutorials	3.03	1.266	97.55	88.94		0.280
8	To search for information from HEC Digital library	2.86	1.321	93.06	91.42	3766.000	0.837
9	To attend online educational courses	2.83	1.319	92.45	91.75	3805.000	0.930
10	To attend online seminars/workshop	2.60	1.309	100.97	87.06	3252.000	0.081

Scale: 1= Never, 2= Rarely, 3= Sometimes, 4= Very Often, 5= Always

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Table 5 shows that all the 03 statements relating to 'perceived ease of use' received a mean score around 4, indicating that majority of the respondents found agree that 'smartphone is easy to operate for accessing information (M=3.74, SD=1.097)', 'it is easy to access information through smartphone (M= 3.57, SD, 1.111)' etc. A set of four statements relating to 'perceived usefulness' received a mean score between 3 to 4 indicating 'mobile learning help to improve my knowledge' (M=3.77, SD= 1.125), 'mobile learning helps me to complete my class assignments quickly' (M=3.68=1.199).

A set of seven statements relating to 'subjective norm', 'behavioral control' and 'students readiness' received mean scores between 3 and 4 shows that majority of the respondents indicated that 'most people close to them are in favor of using a smartphone for learning' (M=3.50, SD=1.171). However, they found neither agree nor disagree with statements such as 'people close to me consider it fine to use a smartphone for learning' (M=3.36, SD=1.129), 'I have a sufficient knowledge to use a smartphone for learning' (M=3.31, SD=1.180), and 'I am in favor of utilizing mobile for learning in education' (M=3.49, SD=1.199).

Mann Whitney U statistic was used to find any difference in male and female respondents' perception towards mobile learning. No significant difference was found between the two statements of "perceived ease of use" such as 'I believe that smartphone is easy to operate for accessing information' and 'I believe that it is easy to search information through smartphone'. However, a statistically significant difference was found in the statement of 'I believe that it is easy to access information through smartphones'. In the case of "perceived usefulness," only one item's p-value was greater than the significant level of 0.05, indicating that the students' perception regarding 'mobile learning helps improve my knowledge' is not significantly different. However, a statistically significant difference was found in the statements i.e., 'mobile learning helps me to complete my class assignments quickly', 'mobile learning keeps my knowledge up-date', and 'mobile learning is more affordable than books'. A statistically no significant difference was found in the perception of male and female respondents about "subjective norms", "behavioral control," and "students readiness" (Table, 5).

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Table.5

Perception of the respondents towards mobile learning (n=183)

Rank	Statements	Mean	SD	Mean Rank		Mann Whitney U	P-value
Perceived Ease of Use				Male	Female		
1	I believe that a smartphone is easy to operate for accessing information	3.74	1.097	83.62	96.62	3290.000	0.094
2	I believe that it is easy to access information through a smartphone	3.57	1.111	80.95	98.09	3116.500	0.028
3	I believe that it is easy to search for information through a smartphone	3.52	1.362	89.26	93.51	3657.000	0.590
Perceived Usefulness							
1	Mobile learning help improve my knowledge	3.77	1.125	87.25	94.62	3526.000	0.334
2	Mobile learning helps me to complete my class assignments quickly	3.68	1.199	75.04	101.34	2732.500	0.001
3	Mobile learning keeps my knowledge up-date	3.64	1.182	79.93	98.65	3050.500	0.017
4	Mobile learning is more affordable than books	3.37	1.211	78.14	99.64	2934.000	0.007
Subjective Norm							
1	Most people close to me are in favor of using a smartphone for learning	3.50	1.171	86.48	95.04	3476.000	0.275
2	People close to me consider it fine to use a smartphone for learning	3.36	1.129	93.01	91.44	3769.500	0.840
Behavioral control							
1	I have a sufficient extent of self-confidence to	3.53	1.083	87.62	94.41	3550.000	0.380

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Rank	Statements	Mean	SD	Mean Rank		Mann Whitney U	P-value
				Male	Female		
	decide to adopt m-learning						
2	I have sufficient knowledge to use a smartphone for learning	3.31	1.180	87.16	94.67	3520.000	0.336
Students readiness							
1	To me, learning through mobile is a good educational tool	3.58	1.055	93.98	90.91	3706.000	0.695
2	I have adequate technical skills to use a mobile device for learning	3.56	1.136	86.34	95.12	3467.000	0.260
3	I am in favor of utilizing mobile for learning in education	3.49	1.199	87.57	94.44	3547.000	0.382

Scale: 1= Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree, 5= Strongly Agree

The respondents were asked a set of 13 statements to identify their problems while using the mobile for learning. Of the 13 statements, 06 statements received a mean score of around 4, indicating that the majority of the respondents' very often' faced the problems of 'sore eyes while reading mobile contents' (M=3.69, SD=1.206), 'mobile screen size makes it difficult to concentrate on contents' (M=3.67, SD=.984), 'mobile learning demand more storage space' (M=3.57, SD=1.136), 'mobile reading cause headache' (M=3.55, SD=1.137), 'mobile reading cause muscle strain' (M=3.55, SD=1.156), and 'ads create a disturbance while reading something online' (M=3.51, SD=1.195). However, respondents "sometimes" faced the problems relating to 'difficulty of finding related material through mobile' (M=3.13, SD=1.095) and 'mobile learning offer limited content' (M=3.01, SD=1.172).

Mann Whitney U statistic was used to assess any difference in the problems faced by male and female respondents while learning through mobile. Of the 13 statements, the p-value of 02 statements was lower than the significant level of 0.05, indicating that problem of 'sore eyes while reading through mobile', and 'ads

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creating a disturbance while reading something online' are significantly different between male and female respondents (Table 6).

Table 6

Problems faced by the respondents during mobile learning (n=183)

Rank	Statements	Mean	SD	Mean Rank		Mann Whitney U	P-Value
				Male	Female		
1	Mobile reading cause sore eyes	3.69	1.206	80.52	98.33	3088.500	0.024
2	The mobile screen size makes it difficult to concentrate on contents	3.67	.984	84.63	96.06	3356.000	0.138
3	Mobile learning demands more storage space	3.57	1.136	82.42	97.28	3212.500	0.060
4	Mobile reading cause headache	3.55	1.137	84.14	96.33	3324.000	0.123
5	Mobile reading cause muscle strain	3.55	1.156	83.18	96.86	3261.500	0.084
6	Ads create a disturbance while reading something online	3.51	1.195	80.06	98.58	3059.000	0.019
7	It is difficult to check the authenticity of information	3.45	1.041	94.15	90.81	3695.000	0.669
8	It is difficult to articulate question while searching online	3.44	1.061	93.38	91.24	3745.500	0.785
9	Mobile learning makes me mentally tired	3.44	1.051	86.22	95.19	3459.000	0.255
10	Internet connectivity prevents me to learn through mobile	3.39	1.083	99.79	87.71	3328.500	0.123
11	Screen reading is less friendly than print	3.33	1.323	87.52	94.47	3544.000	0.384

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Rank	Statements	Mean	SD	Mean Rank		Mann Whitney U	P-Value
				Male	Female		
12	It is difficult to find the required material through mobile	3.13	1.095	97.38	89.04	3485.500	0.289
13	Mobile learning offers limited content	3.01	1.172	92.38	91.79	3810.500	0.941

Scale: 1= Never, 2= Rarely, 3= Sometimes, 4= Very Often, 5= Always

DISCUSSION

This study was conducted to assess the level of readiness towards mobile learning among students. The data collected on the stages of change model showed that university students are at the stage of "maintenance" which identifies their sustainable behavior of using smartphones to access online information- this finding is comparable with the results of other studies (Buksh, Mahmood and Sengi, 2015; Al-Emran, Elsherif, and Shaalan, 2016; Cheon, Lee and Crooks, 2012; & Mahat, Ayub and Wong, 2012) that indicated adaptive behaviors of students in using the mobile phone for accessing information. The attitude, subjective norms, and behavioral control positively influenced the intention to adopt m-learning. These factors are different as reported by Buksh, Mahmood, and Sengi (2015), which included smartphones' features, prior knowledge to operate them for learning, availability of cellular connection, and willingness to adopt m-learning. There is a need for policymakers to consider the factors affecting the acceptance and rejection of m-learning in higher education institutions.

Our results showed that students use smartphone devices mainly to access web search engines to access required information (Google, Yahoo, MSN, etc.) among all educational and research purposes. Our findings support the findings of other studies that indicated the use of mobile devices for educational and research purposes (Schreiber, Fukuta, and Gordon, 2010; Rowlands et al., 2008). Moreover, the approachability of social media applications through these devices enhances collaboration and interaction among learners.

Students' perception towards m-learning is an important consideration as behavior and attitude are mainly influenced by perception. The respondents showed a positive perception of mobile-learning. Positive perception about mobile phones usage for learning is also reported in the literature (e.g., Cheon, Lee, Crooks,

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and Song, 2012; Al Fahad, 2009; Dashti & Aldashti, 2015; Alhajri, 2016).From years, university libraries provide access to web OPACs, electronic databases, peer-reviewed journals, reference services, digital libraries, and institutional repositories.

Faculty and students in higher education are frequently using library websites to access HEC digital library, reference services, and web OPACs to search for information resources (Mairaj, 2016). These results are quite encouraging for libraries to create value and mobile-oriented content through websites or digital libraries supported with smartphone design in terms of the user interface, search strategies to access information of all formats e.g., text, audio, visual, images, videos, etc. The creation of these contents may not be utilized properly if students of higher education are not encouraged to enhance learning abilities through wireless technologies such as mobile devices, smartphones, PDAs, and laptops.

Most of the time, rather than educational purposes, university students prefer smartphones for communication through messages, calls, and social networking sites (Mahat, Ayub & Luan, 2012). Although it is an advantage of today, youth is indulging in its negative usage (Kamran, 2010). Libraries should play a positive and constructive role by providing digital resources to keep their place in the mobile world (Fernandez, 2015). Most importantly, there is a need to provide hands-on training to motivate students about the positive use of mobile devices for their learning and academics.

With the digital age's popularity, smartphones are at their peak in higher education venues to help students anywhere, anytime, where they want to learn. Libraries could provide maximum digital contents, information-rich social networking sites, virtual reference service, current awareness service, selective dissemination of information, RSS and topic alerts of new arrivals, emails or messages alerts on the activities being conducted in the libraries relating to users' interest e.g., orientation programs, digital information literacy skills, online resources to collect data, sessions to support research activities such as training on analysis tool SPSS, reference management through Endnote and Mendeley, an authentic resource to conduct research studies, how to avoid plagiarism, using Turnitin to check plagiarism, methods of writing a research paper and synopsis etc. All this should be accessible for end-users not in terms of messages or email alerts only but also through sharing videos and documents of such activities via the library website and YouTube channels.

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CONCLUSION

During the Covid-19 pandemic, the methods and delivery of formal education have been changed worldwide. Teaching and learning go online from physical interactions and classrooms. Our study results showed a higher level of readiness among university students for accepting mobile technologies for their education. Although some barriers prevent mobile technologies for e-learning that included mobile reading cause sore eyes, the mobile screen size makes it difficult to concentrate on contents and mobile reading cause headache.

The study carries important practical implications, including that the stakeholders must support the blended teaching approach, which includes teaching in classrooms and online classes using video conferencing platforms such as ZOOM and Google Meet, etc. The other includes the role of academic libraries during the pandemic, which has increased more than ever. The world has gone under lock-down, teaching institutions have been closed due to coronavirus. The students were struck at homes. In this situation, libraries are required to take a leading role in providing library and information services to students through online modes. Smartphones are the main source for students to access information, take online classes, and continue their studies without interruption.

Limitation and Future Research Direction

This study has some limitations in terms of sample size and sampling range and survey methodology for data collection. Participants for the study were from only one university. Therefore, care should be exercised when generalizing its results to a larger population. The study adopted survey research methods, which always has its limitations in terms of respondents' biasness, understanding of the statements, and recording the responses. Another limitation of the study is measuring only the 'readiness' factor of m-learning using the stages of change model. Future studies increase the sample size using other factors influencing the adoption of m-learning i.e. faculty and university support, social, and facilitating conditions. Studies may be conducted using different research methodologies such as qualitative methods or mixed methods research designs.

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