

## Implementation Challenges of Mobile Learning in Pakistan

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### ABSTRACT

Presently the new technology of ICT globalizes the mobile learning in today's modern world. M-learning plays a vital role in education but the implementation of mobile learning faces many challenges. Most of the issues are related to technical, social and education challenges. This research explores different issues that can have negative effect on implementation of mobile learning by the use of quantitative survey methodology. A formulated Frame work is presented for the challenges of mobile learning implementation and total of nine different hypothesis are developed. Out of the nine hypothesis seven hypothesis are supported and the rest of the two hypothesis are rejected in the final results.

**KEYWORDS:** Mobile Computing, Mobile learning, education, Distance learning.

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### 1. INTRODUCTION

Day by day improvements in the field of communication and information technology helps to get education more easily and quickly according to the needs and understandings of a learner. In other words the information technology has brought rebellion in the field of education [1]. It changes the life style of the individual growth i.e. information was exchanged through postal services and then gradually to computer [2]. The growing awareness in information technology makes it possible to emerge the new and different educational forms like D-learning, E-learning and m-learning. D-learning is a super set of e-learning where E-learning is a super set of m-learning [3]. On the other hand m-learning is considered a valuable tool for developing the educational outcomes [4]. M-learning plays a vital role in distance learning because the students who are not physically/ mentally fit to enter into classroom can learn through M-learning very easily and appropriately [5]. Mobile Smart phone change the meaning of learning [5]. The learner feels a great sense of freedom of time and space with mobile phone so they can study any where any time they want [6]. In the 21<sup>st</sup> century everyone can buy its own ICT device and with help internet connect to the outer world and get education more easily and quickly by the help of some educational tutorials and by visiting educational blogs by enrolling himself in some online institution. The overall discussion on m-learning has focused its need and importance in education. But the adoption of mobile learning technology has face many challenges [7] which include technical, social and educational challenges [8][9][10]. Many literature proofs that there are some basics challenges which face m-learning implementation. This study is focused on to examine the challenges for implementation of m-learning in Pakistan. . On the behalf of the above discussion it can be concluded that there are two main factors (technical challenges, social and educational challenges) which effect mobile learning

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challenges. The collection of data is performed using survey based approach using existing literature. The proposed Frame work is below for mobile learning challenges in Pakistan.

## 2. Frame work and hypothesis development

In the following fig. 1, hypothesis for the study which affects the implementation challenges of m-learning in Pakistan and proposed a frame work is shown. According to the introduction section there are two main factor which face implementation challenges of m-learning in Pakistan.

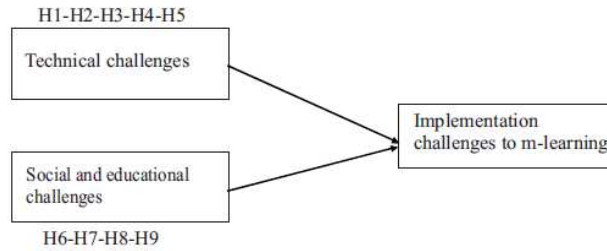


Fig1: Hypothesis Development

The above frame work is proposed using the two main factors which face implementation challenges of m-learning in Pakistan.

## 3. Technical challenges of mobile learning in Pakistan

### 3.1 Connectivity and Battery Life

Mobile learning is being affected by the connection problem when the student want some contents the connectivity issue is being raised and the battery life of the mobile learning devices is too short [11][13]. The connectivity and short battery life is selected for the hypothesis to check that this issue originates the implementation challenges of mobile learning or not.

***H1: connectivity and battery life has a positive relationship with implementation challenges of mobile learning.***

### 3.2 Screen and key size

In m-learning the screen size of the smart phone is too small and the learner does not feel relax in m-learning and strain the eyes for using the device for long hours and the size of the key board is too small and by pressing one button another is pressed which is very annoying[14][15]. So the screen size and key size of the mobile learning devices is selected for the hypothesis to check that issue originate the implementation challenges of mobile learning or not.

***H2: screen size and battery life has a positive relationship with implementation challenges of mobile learning.***

### 3.3 Limited memory

The storage capacity of m-learning devices is not enough to store the learning materials by the learner a limited memory is provided by the companies which is not sufficient for storing the learning material in the device [15]. So the limited memory of the mobile leaning devices is selected for the hypothesis to check that the issue originate the implementation challenges of mobile learning or not.

***H3: limited memory has a positive relationship with implementation challenges of mobile learning.***

### 3.4 Low bandwidth

The low bandwidth of the mobile learning devices is seemed to be a challenge for implementation of mobile learning [13] where the implementation of 3g and 4g technology is not fully implemented yet in Pakistan by most of

the broad band companies [16]. To determine that low bandwidth of mobile learning devices originate the issue of implementation challenges of mobile learning.

***H4: low bandwidth has a positive relationship with implementation challenges of mobile learning.***

### **3.5 Security content and copy right**

Using the material of the other peoples Security of the content or copyright is required from the authoring group but using the new technology of mobile learning this issue is occur and originates the problem in mobile leaning[8]. To check whether this issue originates the implementation challenges of mobile learning in Pakistan or not selected as a hypothesis for this study.

***H5: security content and copyright has a positive relationship with implementation challenges of mobile learning.***

## **4. Social and educational challenges of mobile learning in Pakistan**

### **4.1 English competency**

English competency is one the big issue in education sector of Pakistan most of the people did not speak the English language [17] because of the native language which is Urdu most of the people did not understand and take and effective advantage from m-learning in Pakistan because most of the content provider in the m-learning is in English and this creates a Barriers to the implementation of m-learning and creates the intervention to the m-learning technology[18]. To check that English competency originates the implementation challenges of mobile learning in Pakistan or not also selected as a hypothesis for this study.

***H6: English competency has a positive relationship with implementation challenges of mobile learning.***

### **4.2 Face to face meeting**

In any learning environment face to face meeting with the instructor is required for the student satisfaction [17] and the majority of online learning technology adopts Asynchronous approach for learning so this can create a certain limits between the student and instructor [19] . To check that face to face meeting is originates the implementation challenges of mobile learning in Pakistan or not selected for the hypothesis.

***H7: face to face meeting has a positive relationship with implementation challenges of mobile learning.***

### **4.3 Frequent changes of mobile learning devices**

The rapidly growing industries of mobile phones brought newer and good quality mobile phones than the existing one. Changes of frequent devices functionality and models brought a big challenge in the front of mobile learning implementation [8]. To check that a frequent change of mobile learning devices is originates the implementation challenges of mobile learning in Pakistan.

***H8: frequent changes of mobile learning devices have a positive relationship with implementation challenges of mobile learning.***

### **4.4 Distraction risk**

The mobile phones can create a distraction in the learning environment for example m-learner can be easily distracted from learning via call ,social media updated like face book , twitter etc. Many countries has banned the mobile phones during the class timing due to disturbance of the learning environment[5][14]. To check that the distraction of mobile phones originates the issue for implementation challenges of m-learning in Pakistan or not so the hypothesis is selected for the study below.

**H9: distraction risk of mobile learning has a positive relationship with implementation challenges of mobile learning.**

**5. RESEARCH METHODOLOGY**

**5.1 Targeted population and sampling**

The targeted area of our population is students from undergraduate and graduate from the University of AWKUM. The total sample of our questionnaire is 290 which is distributed among both gender male and female all the students are from the department of computer science and having the knowledge of m-learning. For the final selection out of 290 questionnaire 163 questionnaire is selected for the final study which is fill proper among all the questionnaire. The rest of the questionnaire is rejected in which some lost and some not fill properly. In the total 61 female and 102 male fill the questionnaire properly were selected for the final study.

**Equation for the regression analysis**

$$Y_{predicted} = b_0 + b_1*x_1 + b_2*x_2 + b_3*x_3 + b_4*x_4.....b_n*x_n$$

Y is the independent value in this equation we want to predict and b<sub>0</sub>, b<sub>1</sub> till b<sub>n</sub> is the dependent values in this equation any changes in dependent variable which is positive or negative effect the overall model. One unit change in independent variable effect another variable also.

**5.2 Reliability analysis**

With the help of cronbach’s alpha test the reliability of the questionnaire is analyzed. According to that the acceptable value for alpha is 0.70 and the alpha value is lie between 0 and 1 higher alpha value does not mean that the data is perfectly reliable the length of items is also affect the alpha value [20][21].

The reliability result of cronbach’s alpha is shown in fig. 2. The total numbers of questionnaire is represent by N in the fig. 2, and N of item shows the overall items included in the study for testing reliability

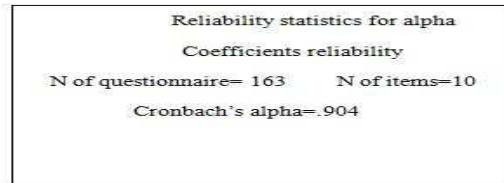


Fig 2: Reliability statistics

The cronbach’s alpha value of this study is shown in fig 2, with value of 0.904 which is larger than the accepted value its represent the consistency of our data that this data is 90.4 percent reliable for this study.

<b>Reliability Statistics for technical challenges for m-learning</b>	
Cronbach's Alpha	N of Items
0.813	5

Fig 3: Reliability Statistics for technical challenges for m-learning

**5.2.1 Reliability analysis for Technical challenges for m-learning implementation in Pakistan**

The cronbach’s alpha value of the technical challenges for m-learning is 0.813 in the fig. 3, which is larger than the

accepted value 0.70 it's denoted the consistency of our data that this data is 80.3 percent reliable and effective for the analysis for this study. The total number of items is 5 which are tested in technical challenges for m-learning.

Reliability Statistics for social and educational challenges for m-learning	
Cronbach's Alpha	N of Items
0.728	4

Fig 4: Reliability Statistics for social and educational challenges for m-learning

### 5.2.2 Reliability analysis for Social and educational challenges for m-learning implementation in Pakistan

Reliability statistics for social and educational challenges for m-learning is 0.728 in the fig. 4, which is greater than the acceptable value means that this data is 72.8 percent consistent and effective for the analysis of this study. The total number of item is 4 which are tested for the analysis of this study.

### 5.3 Hypothesis testing

The hypothesis section of this paper presents the analysis and result which we receive from the study. Regression technique is used to examine the association among different variable. Earlier than presenting the analysis and results, it is essential to present the definition for different regression coefficients, by which we conclude the results. R,  $R^2$  and p which indicated the (significance) which is used to conclude the result and hypothesis section. R shows the strength and weaknesses association or relationship. The value of R nearer to positive 1 indicates the strength correlation where the value of R nearer to 0 indicated the weaker correlation and R value under 0 shows the negative correlation. The negative and positive sign indicate the path or direction of correlation relationship. The value is directly proportional to each other if one value increases the other value also increases if the one value is decreases the other value automatically decreases.  $R^2$  indicates the variance percentage of dependent variable due to independent variable and P indicates the significance of the relationship. If the value of p is less than 0.05, then the relationship is significant and effective for the analysis otherwise not [22].

#### 5.3.1 Technical challenges for m-learning

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977 <sup>a</sup>	.954	.952	.25851
a. Predictors: (Constant), q6, q4, q3, q2, q5				

Fig 5: Regression analysis Technical challenges for m-learning

Fig. 5, indicates the value of R which is 0.977 this indicates that overall independent variables have strong correlation with implementation challenges for m-learning. While the other value  $R^2$  which is 0.954 indicates the variance of dependent variable which is divine or predicted by the independent variable.

The following value of  $R^2$  indicated that 95.2 percent of variance in implementation challenges of m-learning is predicted by all independent variable (connectivity and battery life, screen and key size ,limited memory, low bandwidth, security contents or copy right ).

### 5.3.2 Technical Challenges for M-Learning:

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.595	.120		-4.964	.000
	Connectivity and battery life	.968	.025	.952	37.969	.000
	Screen size and key size	.139	.020	.144	6.935	.000
	Limited memory	.169	.030	.105	5.615	.000
	Low bandwidth	-.037	.024	-.042	-1.542	.125
	Security content and copyright issues	-.085	.029	-.083	-2.951	.004
a. Dependent Variable: Mobile learning challenges						

Fig 6: Results of technical challenges for m-learning

The following fig .6, shows the final results of connectivity and battery life of m-learning devices having the beta value is 0.952 this indicates the positive impact of connectivity and battery life of m-learning devices with mobile learning challenges furthermore value of P (significance) is 0.000 which is smaller than 0.05 it indicates that there is approving correlation of connectivity and battery life of mobile learning devices and dependent variable mobile learning challenges. The final conclusion of the hypothesis connectivity and battery life of m-learning devices is supported and effective for the analysis of this study. Screen size and key size of mobile learning devices having the beta value of 0.144 which shows the positive correlation with mobile learning challenges and having the P (significance) value 0.000 which is smaller than the accepted value of 0.05 its indicate that screen size and battery life of mobile learning devices is supported and effective for analysis of this study. Another hypothesis limited memory of m-learning devices having the beta value of 0.105 which indicates the positive impact with mobile learning challenges and having the P (significance) value .000 which is also smaller than the accepted value 0.05 this indicate that limited memory of mobile learning devices is supported and effective for the analysis of this study. Low bandwidth of m-learning devices having the beta value -0.042 which indicate the negative correlation of low bandwidth with mobile learning challenges also having the P (significance) value 0.125 which is greater than the accepted value of (P significance) 0.05 this hypothesis indicates that it is not supported and effective for the analysis of this study. Security contents and copy right issue in m-learning devices having the beta value of -0.083 which indicate the negative correlation with mobile learning challenges and having the P (significance) value of 0.004 which is smaller than the accepted value of P (significance) 0.05 this hypothesis indicates that security contents and copy right issue in m-learning devices is supported and effective for the analysis of this study.

### 5.3.3 Social and Educational Challenges for M-Learning

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.924 <sup>a</sup>	.853	.850	.45812
a. Predictors: (Constant), q10, q9, q7, q8				

Fig 7: Regression analysis of Social and educational challenges for m-learning

The following fig .7, indicates that the value of R is 0.924 which indicate the strongly correlation of implementation challenges of mobile learning with respect to independent variable. Another value of R<sup>2</sup> is 0.853 which indicates the variance of dependent variable which is divine by the independent variable. The value of R<sup>2</sup> which is 85.3 percent indicate the variance of dependent variable mobile learning challenges Which is predicted by all independent variable ( English competency, face to face meetings, frequent changes of mobile learning devices and distraction risk).

### 5.3.4 Social and Educational Challenges for M-Learning

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.397	.131		-3.027	.003
	English competency	.732	.035	.759	20.617	.000
	Face to face meeting	.111	.040	.122	2.771	.006
	Frequent changes of mobile devices	-.030	.036	-.027	-.826	.410
	Distraction risk	.138	.036	.163	3.797	.000
a. Dependent Variable: Mobile learning challenges						

Fig 8: Results of Social and educational challenges for m-learning

The social and educational challenges for m-learning are shown in the following fig. 8. The first dependent variable English competency having the beta value of 0.759 which indicates the positive correlation with mobile

learning challenges and having the P (significance) value is 0.000 which is smaller than the accepted value of P (significance) 0.05 overall result of English competency is selected for the analysis because it's the supported facts. Another facts face to face meeting having the beta value of 0.122 which also indicates the positive correlation of face to face meeting with mobile learning challenges and also having the P (significance) value of 0.006 which is smaller than the accepted value of P (significance) it's meant that this fact is supported and select for the analysis of this study. Another most important fact frequent changes of mobile learning devices having the beta value of -0.027 which indicated the negative correlation with mobile learning challenges and also having the P (significance) value of 0.410 which is greater than the accepted value of P (significance) of 0.05 it indicates that this fact is not supported and not effective for the analysis of this study. Last dependent variable Distraction risk having the beta value of 0.163 which indicates the positive correlation with mobile learning challenges and the P (significance) value of 0.000 which is smaller than the accepted value of P (significance) 0.05 this fact is supported and select for the analysis of this study.

**5.3.5 Overall Results of Hypothesis**

Hypothesis No.	Dependent variable	Independent variable	Result
H1	M-learning challenges	Connectivity and battery life	Supported
H2	M-learning challenges	Screen size and key size	Supported
H3	M-learning challenges	Limited memory	Supported
H4	M-learning challenges	Low bandwidth	Not supported
H5	M-learning challenges	Content security and copy right issue	Supported
H6	M-learning challenges	English competency	Supported
H7	M-learning challenges	Face to face meeting	Supported
H8	M-learning challenges	Frequent changes of mobile devices	Not supported
H9	M-learning challenges	Distraction risk	Supported

Fig 9: Overall results of hypothesis

The following fig .9, show the overall result of hypothesis in which two hypothesis is not supported and the rest of seven hypothesis is supported and effective for the analysis of this study. One hypothesis which is from the technical challenges is low bandwidth is rejected and not include for the analysis of this study. Another one which is rejected from the hypothesis and which is not supported in this study is from the social and educational challenges is frequent changes of mobile learning devices and not selected for the analysis of the study.

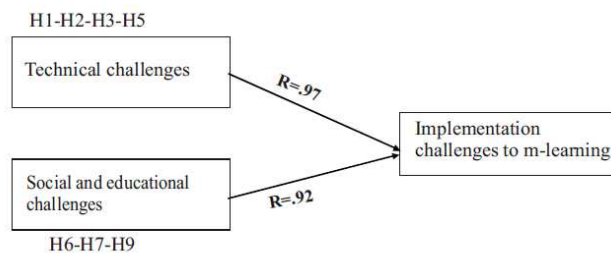


Fig 10: Proposed frame work for the final hypothesis



The result of R is calculated for five dependent variable (connectivity and battery life, screen size and key size, limited memory, low bandwidth, incapable of printing and security contents and copy right issue) from the technical challenges in mobile learning having the value 0.977 which shows the strong correlation with mobile learning challenges and indicates that due to technical challenges of mobile leaning increase the challenges in mobile learning. At the end the value R is calculated for four dependent variable (English competency, face to face meeting, frequent changes of mobile leaning devices, distraction risk) in social and educational challenges of mobile leaning which having the value of 0.924 which also indicates the strong positive correlation with mobile learning challenges the increase in social and educational challenges of mobile learning increase the mobile learning challenges.

## 6. Conclusion

In this study two different factors technical challenges, social and educational challenges are examine on the basis of nine different hypothesis. In nine hypothesis two hypothesis (low bandwidth, frequent changes of mobile learning devices) is not supported at the end of the study a frame is proposed for the supported hypothesis. This indicates that two hypothesis (low bandwidth, frequent changes of mobile learning devices) didn't create any challenge to the implementation of mobile learning and the rest of seven hypothesis highly affect the implementation challenges of mobile learning.

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