AN EMPIRICAL INVESTIGATION FOR USER SATISFACTION ABOUT E-LEARNING SYSTEMS IN PAKISTAN

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ABSTRACT: *The purpose of this research is to investigate the satisfaction of E-Learning System Users within the context of Pakistan. This research used IS Success Model to examine the success of E-Learning Systems. A conceptual framework has been proposed and validated within the context of Pakistani users. A conceptual framework was constructed on the premise that System Quality including System Interactivity (SI), System Availability (SA), System Response Time (SRT), and Efficiency (SE), Service Quality includes Assurance (SAS) and Information Quality includes Ease of Understanding (EU), Reliability (SR) influence User Satisfaction (US). The conceptual framework E-Learning Enhancement Model (ELEM) was developed using related literature review and also by conducting surveys with the Users of E-Learning System (i.e. learners, instructors) in Pakistan. Data were collected from 141 Users of E-Learning System through a quantitative approach in order to investigate success of E-Learning Systems. The findings can be used by policy makers for implementation and success of e-learning in Pakistan by concentrating on the constructs validated in current study.*

Keywords IS Success, E-Learning, User satisfaction, System quality, Information quality, Service Quality, Pakistan

1. INTRODUCTION

Pakistan is a multi-ethnic, multilingual and emerging country and has become the second largest economy in South Asia. The tremendous growth in Information and Communication Technologies (ICTs) has paved the way for E-Learning in Pakistan [1]. Information and Communication Technologies has provided us new innovations and opportunities in Asia (Olsen, 2015). E-Learning system is used to share ideas and knowledge among learners and instructors [2]. The success in E-Learning is defined in terms of the reduction of time and cost in training learners or E-learners, ease of access for learners and instructors, learner's satisfaction and offering other services to support teaching and learning. Learners as well as instructors can get benefits from E-Learning system to enhance and improve their education in a way they fit in. There are many advantages of E-learning over traditional learning. E-Learning use different technologies for this purpose [3]. An E-Learning System is the software application which facilitates E-Learning. LMS provide effective means for these institutions to supplement their customary methods of teaching. This research investigates satisfaction of users of E-Learning Systems by learners and instructors as a supplement to the traditional face-to-face way of education. The scope of this research is not limited to a single aspect of the E-Learning in Pakistan; rather it covers the satisfaction of user of E-Learning systems. The research is to realize the factors which influence user Satisfaction towards E-Learning System in Universities of Pakistan.

This research is an attempt to recognize the factors that affect satisfaction of use of E-Learning system in Pakistan. It will also provide an E-Learning Enhancement Model (ELEM). In perspective of Pakistan, there were few studies done to improve higher education. These studies focused on different methods to improve education but there is no significant study that investigate satisfaction of user in Pakistan [4].

Therefore, the current study is designed to address this gap in literature with following objectives:

- To examine the influence of factors that affect satisfaction of users of E-Learning Systems in Pakistan

- To propose a framework that highlighting factors that influence the satisfaction of the users to use E-Learning systems and also to modify according to the native context of Pakistan.
- To propose a set of recommendations for the effectiveness of E-Learning System in the educational process.
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2.   MATERIALS AND METHODS

2.1.   Proposed Information System Success Model and Hypothesis

Information System Success issue had long-standing discussion between information system scholars. There are numerous techniques to measure the achievement which have been presented and also used. Moreover, different expressions were used to describe that. There are many models that has been adopted, debated and legalized. One of them is Information System (IS) Success Model [5], [6].

In 1992, DeLone & McLean presented IS Success model adopted from communication theory which is among the most prominent concepts in expecting and enlightening satisfaction of user, and IS success. The IS Success model used to assess E-Learning System success due to the solid theoretical foundation and the numerous successful empirical studies. The basic IS Success model contains six categories *viz.* Information Quality, System Quality, User Satisfaction, Systems Use, Organizational Impact and Individual Impact as shown in Figure 1[5] recommended that Information quality and System quality mutually and individually have impact on the satisfaction of user.
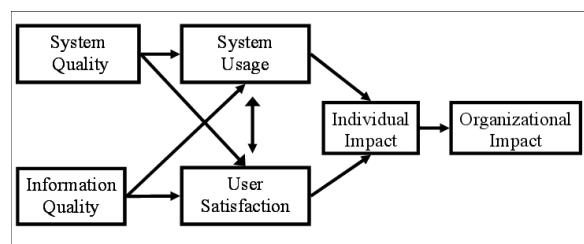

Figure 1 : IS Success Model [6]

In 2003, they suggested a restructured IS Success Model. They also calculated its usefulness in IS practice, especially the appearance of this model in web-based applications. Based on previous readings, the IS Success model was simplified by the addition of *"Service Quality"*. Therefore, the updated model contains six categories viz. System Quality, Information Quality, Service Quality, User Satisfaction, Net Benefits and Intention to Use as shown in Figure 2.

With the perspective of E-Learning, the learning activities are directed through web-based applications which makes an E-Learning System both a system and communication sensation which gives itself to restructure IS Success model. In this research study, we adopted [5] IS Success model as part of the proposed framework to create a tool for evaluating the success of E-Learning Systems.
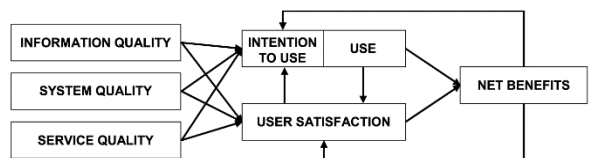

Figure 2 : IS Success Model [5]

The research target is to recognize User' opinion about the factors influencing the user's satisfaction to use E-Learning Systems in Pakistan. System Interactivity, System Availability, System Response Time, System Efficiency, System Assurance, System Reliability, and Ease of Understanding are all proposed factors added to IS Success Model to develop new framework named as E-Learning Enhancement Model (ELEM) which is shown in Figure 3.
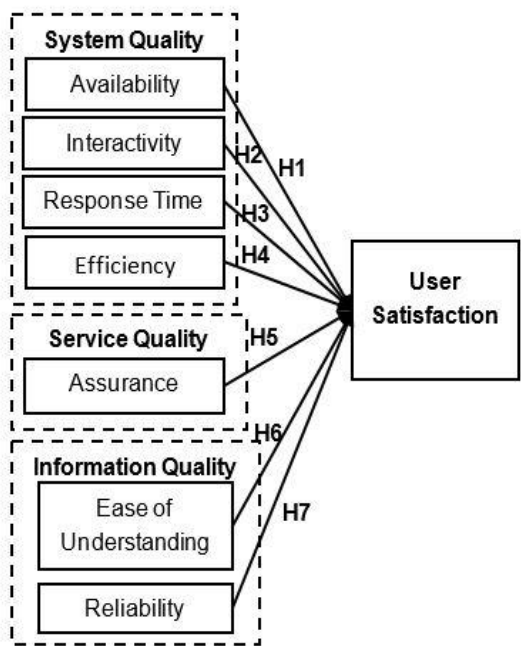

Figure 3 : E-Learning Enhancement Model (ELEM)

2.1.1. System Availability
Consistency and download time are the parameters which have been used to measure System Quality [7], [8]. Availability of information for anyone, anywhere, at any time is changing the role of formal education. So, it brings E-learning as a new means of distance learning [9], [10].

H1. System Availability (SA) will positively impact the User.

2.1.2. System Interactivity
System interactivity allows learners to communicate with each other via internet. It also allows learners to communicate with instructors. System interactivity inconsequentially effects on users' satisfaction towards E-Learning System [11]. If E-Learning System provide communication for the users then the system is said to be successful. It is important for the success of E-Learning System as it connects learners, instructors and the material on system. The communication between learners and instructors, and the cooperation in learning is outcome of such communications.

H2. System Interactivity (SI) will positively impact the User Satisfaction.

2.1.3. System Response Time
Time to get a response after a user request or an interact with a Web site, e.g., download time [12]. A poor or bad response time of E-Learning System could annoy user. If time to load information, graphics and actions is less, the more chances are there that the user is satisfied with the E-Learning System.

Response time is the time occupied to respond the request of the user. Total amount to which user observes that the response from the E-Learning System is reliable, fast, and rational [13].

H3. System Response Time (SRT) will positively impact the User.

2.1.4. System Efficiency
Ability to accomplish task in a short time. The time required for accomplishing a task [14]. The E-Learning System is said to be successful when in short interval of time a user can complete his/her task effectively.

System Efficiency contracts with how good and fine the system perform a task. E-Learning System should be efficient to perform a task in short span of time.

H4. System Efficiency (SE) will positively impact the User Satisfaction.

2.1.5. System Assurance
Assurance is a sign of the knowledge of organization system and the capability to motivate and build belief and self-confidence of user [15], [16]. System Assurance wouldn't be very important for influential users because of the absence of their self-confidence and skills.

H5. System Assurance (SAS) will positively impact the User Satisfaction.

2.1.6. Ease of Understanding
Ease of Understanding, easy to read and understand [17]. User may understand the material that is provide on E-Learning System. The information and data that is delivered on E-Learning System must be easy and understandable by the user. Understandability of the information by the user may increase the satisfaction to use E-Learning System. The texts, the page, and labels should be easy to understand. If

web page of system is easy to understand then the satisfaction of user towards E-Learning System increases.

H6. Ease of Understanding (EU) will positively impact the User Satisfaction.

2.1.7. System Reliability

In order to achieve the assured service consistently and precisely, the E-Learning System attempts to expand the information facilities delivered to users [15], [16], [18]. E-Learning System should be error free to provide reliable information to the user. Reliability of the System shows the competency to achieve the assured service reliably and correctly.

H7. System Reliability (SR) will positively impact the User Satisfaction.

2.2. Research Methodology

A quantitative method is used to measure and test the factors and their relationship in E-Learning system. To evaluate the proposed research framework, a survey questionnaire was used. The questionnaire was built based on IS Success model with adjustments keeping the features of E-Learning System satisfaction. The questionnaire is designed online on "Qualtrics for Online Survey". The target group for this survey are Users of E-Learning Systems. The questionnaire was distributed online and collect data from citizens of Pakistan. The questionnaire consisted of total 33 questions. In addition, items measuring E-Learning System Success also contains demographic information.

2.3. Instrument Development

To create the survey instrument, literature review was studied for existing items that could be used. The items used to operationalize the constructs were carefully chosen from the past studies to narrate precisely to the perspective of E-Learning.

The proposed research items used System Quality, Service Quality, Information Quality, and User Satisfaction that were adapted from previous researches of IS Success Model. The proposed research framework consists of seven independent variables: System Interactivity (SI), System Availability (SA), System Response Time (SRT), System Efficiency (SE), System Assurance (SAS), Ease of Understanding (EU) and System Reliability (SR). The definitions of variables are given in 1.

These seven independent variables are measured by 23 scale items. All items used a 5 point Likert scale ranging from 1-*Strongly Disagree*, 2-*Disagree*, 3-*Neither Agree nor Disagree*, 4-*Agree* and 5-*Strongly Agree* as follows: SI by 3 items, SA by 3 items, SRT by 3 items, SE by 4 items, SAS by 3items, EU by 3 items, and SR by 4 items. Dependent variable User Satisfaction (US) is measured by 3 items.

The items in the questionnaire are closed ended. The questionnaire was pre-tested to establish the validity and reliability of its items.

2.4. Sample Selection Scheme and Data Collection

The target population of this study are Users of E-Learning System in Pakistan. Convenience sampling technique is used in this study. Each independent construct is estimated to have ten data records [19]. There are 7 independent constructs which leads data record to 70 (7x10=70) respondents, i.e. ten

samples for each independent constructs [20]. The sample size which is used in this study is 141 respondents.

3. RESULTS

3.1. Reliability of Questionnaire

The reliability of questionnaire is concerned with stability and consistency of set of measurement. This tells that whether the measurement instrument produce steady and reliable results when repeated many times. In this study, the reliability of the questionnaire is tested by using the commonly used Cronbach's Alpha.

Cronbach's alpha is the frequently used measure of reliability and it measures how well a set of items measures a single one dimensional latent construct. Cronbach's alpha will frequently be little when data have a multidimensional structure. Cronbach's alpha is a coefficient of reliability. The formula for the standardized Cronbach's alpha is shown in Table 1
Where
N= total quantity of variable items
$\bar{c}$ = average inter-item covariance among the items
v = average variance

$$\alpha = \frac{N\bar{c}}{v + (N-1)\bar{c}}$$

As seen from above formula that Cronbach's alpha increases with growth in the amount of items. Furthermore, alpha will be low if the average inter-item correlation is low. Cronbach's alpha also increases when average of inter-item correlation increases. If the inter-item correlations are high, and then there is indication that the items are computing the same essential concept. The recommended reliability values of 0.70 or greater are considered to be acceptable.

The alpha coefficients values along with reliability type are shown in Table 1. The reliability values may fall into four classes [21]:
1. Excellent reliability (0.90 and above)
2. High reliability (0.70-0.90)
3. Moderate reliability (0.50-0.70)
4. Low reliability (0.50 and below)

3.2. Descriptive Statistics

An online survey was conducted to check the satisfaction of user. Learners from higher education were selected for this survey. A sample of 141 usable E-learner responses was obtained from Pakistan. The respondents identified themselves as Information Technology (IT) (56%), Non-IT (44%), of the respondents, 55% were Male and 45% were Female from which 85% are single and 15% were married, the distribution of age was approximately normal; 18-29 (89%), 30-39(9%), 40-49(1%), 50 and above (0%).

The Means and Standard deviation of variables is shown in Table 2.

3.3. Hypothesis Testing

All significance p values were matching the needed criteria and also indicating the acceptance of hypotheses. If value of Significance is **P < 0.05** then the hypothesis is said to be supported or accepted. All hypothesis created in this research are highly significant as the value of all variables is below 0.05. The standardized coefficient of the variables is also shown in Table 3. The construct with high value shows that

this factor affects more on the satisfaction of the user of E-Learning System.

The validated ELEM is given below in Figure 4 with the values that shows their influence on the satisfaction of the E-Learning System in Pakistan.
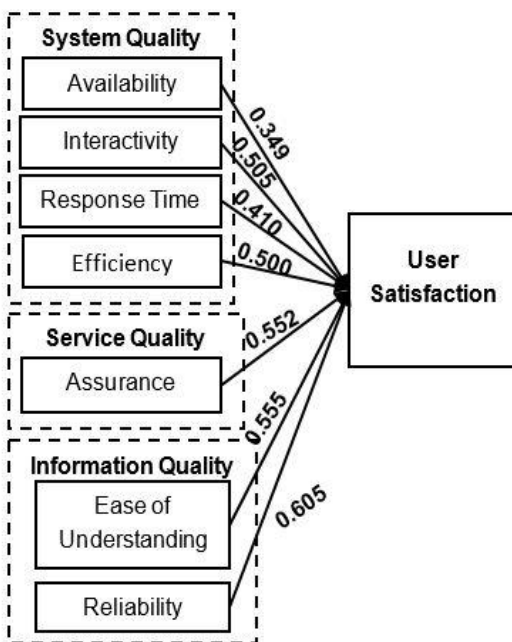

Figure 4 : Validated Conceptual Framework

4. DISCUSSION

The results of the study indicated that there exists a positive connection between System Availability and User Satisfaction with the path coefficient of 0.349 with the *p* value 0.000 which accepts H1. The study found that there exists a positive connection between System Interactivity and User Satisfaction with the path coefficient of 0.505 with the *p* value 0.000 which accepts H2. System Response Time and User Satisfaction with the path coefficient of 0.410 with the *p* value 0.000 which accepts H3. System Reliability and User Satisfaction with the path coefficient of 0.500 with the *p* value 0.000 which accepts H4. H1-H4 are sub factors of System Quality, the most significant beta value is 0.505 so according to this result shows that the System Interactivity has maximum impact on the Satisfaction of users to use E Learning System. System Assurance and User Satisfaction with the path coefficient of 0.552 with the *p* value 0.000 which accepts H5, which shows Service Quality has System Assurance with maximum impact on the Satisfaction of users to use E Learning System. Ease of Understanding and User Satisfaction with the path coefficient of 0.555 with the *p* value 0.000 which accepts H6. System Reliability and User Satisfaction with the path coefficient of 0.605 with the *p* value 0.000 which accepts H7. H6-H7 are sub factors of Information Quality, the most significant beta value is 0.605 so according to this result shows that the System Reliability has maximum impact on the Satisfaction of users to use E Learning System.

5. CONCLUSION

The study has established an integrated Conceptual Framework for investigating the Success of E-Learning Systems in the context of higher education in Pakistan. The results of this study point out the main factors that are satisfying the users of E-Learning System.

This study has both theoretical and practical implications as it suggests a new framework for the satisfaction of users to use E-Learning System based on ELEM that validates new and existing relationships from previous studies.

The results from the statistical analysis concludes that the System Interactivity, System Availability, System Response Time, Efficiency, Assurance, Ease of Understanding, and Reliability had a significant and positive impact on User Satisfaction.

A conceptual framework is proposed by using the IS Success Model. To create the framework, broader variables were also incorporated into the framework after reviewing existing literature. The suggested framework adds value to the current knowledge by including the satisfaction factors to present a complete image of the dominant factors of satisfaction.

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Table 1: Cronbach's α Coefficient of Items

Constructs	No. Of Items	Cronbach's α Coefficient	Type
System Quality			
System Availability	3	0.745	High Reliability
System Interactivity	3	0.778	High Reliability
System Response Time	3	0.567	Moderate Reliability
System Efficiency	4	0.741	High Reliability
Service Quality			
System Assurance	3	0.724	High Reliability
Information Quality			
Ease Of Understanding	3	0.755	High Reliability
System Reliability	4	0.847	High Reliability

Table 2: Means & Standard Deviation of Constructs

Constructs	Mean	Standard Deviation
System Quality		
System Availability	3.924	0.70976
System Interactivity	3.683	0.82839
System Response Time	3.511	0.69870
System Efficiency	3.926	0.65991
Service Quality		
System Assurance	3.858	0.68108
Information Quality		
Ease Of Understanding	3.920	0.64722
System Reliability	3.780	0.73343

Table 3: Hypotheses Testing Results

Hypothesis ID	Hypothesis	Standardized Coefficient (Beta)	Significance (P)
H1	SA→US	0.349	0.000
H2	SI→US	0.505	0.000
H3	SRT→US	0.410	0.000
H4	SE→US	0.500	0.000
H5	SAS→US	0.552	0.000
H6	EU→US	0.555	0.000
H7	SR→US	0.605	0.000