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Critical Factors Which Impact on Students' Satisfaction. A Study of e-learning Institutes of Pakistan

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Abstract: E-learning is the rising phenomenon of delivering education to far off areas through the use of internet technology. This study was carried out on e-learning institutes of Pakistan to find out the influence of critical factors has on students' satisfaction? This research conducted by utilizing thirteen predictor variables under six dimensions (students', teachers,' technology, design, environmental and course) and their effect on criterion variable (Perceived e-learner satisfaction) — the data collected through a self-administered questionnaire. An aggregate of 250 questionnaires distributed among the students of e-learning institutes of Pakistan. The internal reliability of collected data checked through Cronbach alpha, and multiple regression analysis was utilized to test the hypotheses. The findings confirm that critical factors do influence on learners' satisfaction in e-learning institutes of Pakistan as the outcomes of the research demonstrate that eleven out of thirteen predictor variables had a significant impact on the criterion variable perceived e-learner satisfaction. The discoveries of current research would help the e-learning institutes of Pakistan in improving the standard of education and in launching new associated programs because, at the moment, they are offering minimal degree programs in the e-learning environment.

Keywords: e-learning, e-learning management, Environment, System design, Pakistan

Introduction

Nowadays, technology is giving and making progressive changes in every aspect of life. Web-based education is also progressing and introducing new trends of learning like electronic learning (E-learning). It is a strategy that developed from distance education, which permits information imparting and acquiring without the requirements of time or space. Yang and Wang (2014) defined e-learning as the utilization of web-based technologies to convey a vast array of results that improve performance and knowledge. E-learning is defined as the utilization of computer system technology, principally over or through the web, to convey information and directions to people (Ong and Lai, 2006). E-learning is a collective term for preparing, and data accentuates gathering abilities and learning (Iqbal and Ahmad, 2010). In the age of technology, it is evident that quality education and learning routines through e-learning is essential for Pakistan. E-learning idea has been around for quite a long time and is a standout amongst the most significant later improvements in the information system industry (Wang, 2003). Many students prefer internet learning over traditional courses. The main benefits of e-learning include liberating interactions between students and instructors, from obstacles of time and area by way of the asynchronous and synchronous learning model (Katz, 2002). Wu, Tsai, Chen, and Wu (2006) found that the e-learning business sector has a 35.6% development rate; however, failure exists. According to Allen and Seaman (2010), almost 1/3 of students are enrolled in a minimum one online course who are studying in higher education.

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In the USA 2008, four-point six million students were enrolled in a minimum of one online course, which was 17% more than the last year (Bolliger and Halupa, 2012). In 2009, the number of students was increased up to five-point six million, which was 1 million more than the previous year with a growth rate of twenty-one percent (Bolliger and Halupa, 2012). The development rate of admission in online courses is not anticipated that would drop off in the future (Allen and Seaman, 2010). In an e-learning setting, several factors affect the satisfaction of a user. These factors divided into six elements: technology, student, environmental, instructor, system design features, and course (Thurmond, Wambach, and Connors, 2002; Ozkan and Koseler, 2009). Under these six dimensions, thirteen predictor variables included. Variables of students' aspect were students' internet self-efficacy (SIE), students' attitude towards computers (SAC) and students' computer anxiety (SCA); variables of teachers' aspect were teachers' attitude towards e-learning (IAE) and response time (IRT); course aspect had variables e-learning course quality (ECQ) and course flexibility (ECF). Two variables of technology aspects are internet quality (IQ) and technology quality (TQ); variables perceived ease of use (PEU) and perceived usefulness (PUF) came under design aspect and finally environmental dimension had variables diversity in assessment (DA) and learner perceived interaction with others (LPIO) (Sun, Chen, Finger, Tsai, and Yeh., 2008). Selim (2007) concluded that critical success factors (CSFs) in e-learning can be categorized into four features based on student observations containing teachers' attributes (attitude toward learners, teaching style and technology control), students' characteristics (collaboration in interaction, technical competency, motivation, and perception of system and content), technology properties (screen design, ease of access and internet speed) and institution assistance (learning material accessibility and printing, computer availability, technical support). Success factors contain environmental and course elements (Sun et al., 2008). Instructor properties include self-efficacy, timely response, technology control, attitude toward e-learning, focus on interaction, attitude toward students, interaction fairness and distributive fairness and procedural fairness (Sun et al., 2008). According to Akhter, Saleem, and F-Awan (2015) argument, teachers' technology controls, along with giving enough time to interact with learners' influence learning outcomes. E-learning environment refers to receive assessment, use systems for access to online curriculum and communication, obtain instructor assistance, and where students access online assets. E-learning success depends upon the positive learning environment for learners. Learners' perceived interactions with others, perceived autonomy support, diversity in the evaluation, and social influence are elements related to positive e-learning (McLeod, Pippin, and Mason, 2009).

Up till now, researches have been directed on e-learning education, but still, there are few ranges in this subject need to be covered. The six factors (e.g., technology, student, environmental, instructor, system design features, and course) proposed by Thurmond et al. (2002) include almost all aspects of e-learning, but researchers used these factors independently, not as a model. Also, as per the best knowledge of researchers, there is no study carried out in the Pakistani e-learning context that covers all these dimensions to make effective use of this model. In this study, the researcher used these dimensions as a framework to check their effect on PELS. The findings of this research will be advantageous for the educational sector, especially for e-learning institutes of Pakistan. This research will unquestionably offer assistance, infrastructure, acquire in e-learning innovation by conquering possible pitfalls also subsequently lessen the danger of failure during implementation. Moreover, e-learning institutes of Pakistan will utilize the findings of current research as a premise to launch other associated programs that are currently lacking in the e-learning environment. So, the research question is

Research Question: *Whether these six dimensions (e.g., 'technology, student, environmental, instructor, system design features, and course') together can provide a better framework in improving the standard of education in the e-learning institutes of Pakistan?*

Literature Review

Perceived E-Learner Satisfaction (PELS)

The success of educational institutes depends on their student satisfaction and the quality of the services they offer to them. Pakistan is a developing country and coming towards the modern way of education, e.g., e-learning. To satisfying their students, it is necessary to figure out what students feel about e-learning. In understanding the perception of e-learners' satisfaction in e-learning institutes of Pakistan, it is essential to quote the finding of previous studies on e-learning. According to Wickersham and McGee (2008), student satisfaction is an imperative idea because it may eventually cause substantial levels of engagement, motivation, success, learning, and performance. Dennen, Darabi, and Smith. (2007), several factors in the online environment affect student satisfaction like interactivity influence, reliable technology, and instructor behavior. Student satisfaction with internet learning courses is accountable to make sense of if the student takes subsequent courses (McGorry, 2003). Self-efficacy is an imperative measurement of student satisfaction (Shee and Wang, 2008). It utilized as a critical pointer regardless of whether learners would keep on embracing a learning framework (Arbaugh, 2002). Chiu, Hsu, Sun, Lin, and Sun (2005) found that students' satisfaction with e-learning altogether connected with their duration goals. Learner satisfaction is a vital idea because it might at last prompt more significant amounts of inspiration, engagement, learning, execution, and achievement (Wickersham and McGee, 2008). Variables connected with learners' satisfaction in online education are adaptability, computer skills, and convenience (Sahin and Shelley, 2008). Yukselturk and Yildirim (2008) found that in today's market, online program in higher education institution considers student fulfillment as one of the vital components in quality determination. Noel-Levitz (2011) argued that for student accomplishment in online instruction, course grades frequently used as an indicator. Wang (2003) discussed e-learner satisfaction as it is used broadly as a share of assessing the impacts of learning activities and the environment both practically and academically.

Teachers' Dimension

Teachers are the prime source of motivation and learning for the students. Here we want to explore some teachers' characteristics like what is the attitude of a Pakistani teacher in an e-learning environment? Are they treated them fairly in terms of assessment? How much time do they give to their students for understanding the things? Do they respond timely because of response time matters in students' satisfaction? To answer all these questions, we carried out a detailed literature review as (Sun et al., 2008) discussed teachers' responsiveness that it is learners' perception of a prompt response from the instructor to online requests and problems. Arbaugh and Duray (2002) found that learners' fulfillment is positively and significantly associated with teachers' timely response. Teacher attributes are response timelines, self-adequacy, innovation control, concentrate on the association, and attitude towards e-learning, attitude towards students, circulative decency, operational reasonableness, and interactivity (Sun et al., 2008). The teacher gave ample time to collaborate for the time of learning than learners would construct the level of satisfaction (Khan, 2005). Students' perceived satisfaction regarding e-learning positively linked to teachers' speedy replies to students' needs (Ozkan and Koseler, 2009).

According to Cheng (2012), there is a definite significance link between instructor attitude towards e-learners and perceived usefulness of the e-learning system. Perry and Pilati (2011) stated the absence of educators' familiarity with the particular qualities of e-learning might prompt a failed experience. Teachers are vital individuals for constructing learners' conduct in the e-learning course, and in this way, their attitude may influence learners' behavior (Sun et al., 2008). When an e-learner is satisfied with teachers' attitudes; then, this impacts the overall achievement of the learning management system (LMS) positively (Ozkan and Koseler, 2009). According to Al-Busaidi (2012), a teacher's attitude is a unique element for learners' actual utilization of LMS.

Students' Dimension

In Pakistan, e-learning was not a standard model of education decades ago. But now, e-learning is considered a competitive mode of learning. Students show their keen interest in getting admission to e-learning institutes due to its flexibility and other advantages, i.e., low cost, no time, and distance limit. Here, it is crucial to understand and find out what students think about e-learning and what is their attitude towards computer? Do they feel comfortable while using computers, and they have the expertise to deal with web-based learning? Students' computer attitude plays a noteworthy part in the ease of use of web-based learning (Ho and Kuo, 2010). Student attitude to take part in e-learning is also linked to students' prior knowledge in utilizing computer (Selim, 2007). Saade and Bahli (2005) found previous experiences with the computer appear to be a noteworthy element affecting the attitude of learners towards e-learning. There is a need to manufacture a multidisciplinary way to deal with review learners' attitudes towards e-learning. Papp (2000) said that students utilize e-learning if it encourages their learning and permits them to learn whenever anyplace in a particular manner.

E-learning depends mostly on the utilization of PCs as helping tools, a more uplifting attitude toward IT will bring about more productive and satisfied learners in an e-learning environment. According to Saadé and Bahli (2005), previous researchers found that learners with high levels of computer nervousness are at a disadvantage in comparison to individuals with fewer nervousness levels. Rezaei, Mohammadi, Asadi, and Kalantary (2008) found computer nervousness possess an adverse impact on students' goal to utilize a web-based learning system. Nervousness connected with technology can impact student satisfaction and performance (Sun et al., 2008). Saadé and Bahli (2005) found learners' uneasiness looks like a critical variable in connection to students' perception of web-based courses.

Self-efficacy is a vital aspect of student satisfaction. According to Wu, Hsia, and Tennyson (2010), individuals who have an upper level of computer self-efficacy are positively associated with a higher level of learning achievement, which raises the utilization of e-learning. Internet self-efficacy indicates to the faith in one's ability to sort out and execute Internet-related activities required to finish assigned works. Internet self-adequacy is the measure of a person's particular expertise in utilizing a web program. Self-efficacy of internet indicates learners' perspectives, methods, and results in internet guideline (Liang and Tsai, 2008). Self-efficacy is an essential measurement of student satisfaction in the e-learning environment. According to Yang and Lin (2010), in a web-based learning environment, student attitude toward the internet is essential to judge students' interest, performance, and motivation. Internet self-efficacy is positively related to previous Internet-related experience. Learners with high self-efficacy are more certain about achieving e-learning exercises and enhancing their fulfillment (Sun et al., 2008).

Technology Dimension

When developing the e-learning framework, these elements should be considered: technology quality, environmental satisfaction, learning activities, and learners' qualities (Liaw, Huang and Chen, 2007). Here, it is significant for having excellent technical quality and internet quality in e-learning in Pakistan. Previously in Pakistan, technology and internet quality were not that great, but in the last 4 to 5 years, there is a dramatic improvement in technology like hardware and software and also in internet quality due to the launch of 3G and 4G internets. So, researchers wanted to get the answer from students what they think about technology and internet quality also their influence on e-learning education. Learning impact will be higher when the quality and dependability of utilized technology is higher (Sun et al., 2008). Technology quality has a positive effect on learners' satisfaction (Ozkan and Koseler, 2009). System quality has a robust positive influence on learners' satisfaction (Ozkan and Koseler, 2009). System quality comprises internet quality, encouraging conditions, dependability, convenience, equipment availability, and system qualities include interactivity, system functionality, and the response of the system (Wu, Hsia, and Tennyson, 2010).

Course Dimension

Course quality and its flexibility are the primary reasons that learners opted e-learning. E-learning institutes of Pakistan offer many courses in the field of business studies, computer sciences, arts, and social sciences. But the million-dollar question is that whether these e-learning institutes of Pakistan offer learners a high level of course quality and course flexibility, which attracted them to get admission in this mode of education? Here what researchers found in previous literature; Arbaugh (2002) found that course and program flexibility also has a positive influence on learners' satisfaction with e-learning courses. The advantages of e-learning have been broadly discussed as less costly, proper content, and access freedom. E-learning came with modern virtual (anyplace, at whatever time, wherever) class idea (Arbaugh and Duray, 2002). Students like to utilize e-learning if it encourages their training and permits students to realize whenever and anyplace from their own choice (Papp, 2000). Attributes of information quality consist of course quality, course flexibility, and content relevance (Sun et al.., 2008). Learners place incredible esteem on the course where a quality substance is very much composed, successfully introduced, intuitive, unmistakably composed, in the right length, valuable, adaptable, and give suitable level of breath (Shee and Wang, 2008). E-learners' achievement and participation helped by e-learning course flexibility in place, method, and time (Selim, 2007).

Design Dimension

As e-learning is emerging in Pakistan, one thing must keep in mind that the online system should be easy to utilize, and it gives learners the feeling that the usage of this system will help in achieving their goal. We want to clear the importance of perceived ease of use (PEU) and perceived usefulness (PUF) for e-learners in Pakistan by previous literature. PUF directly effects on intention to utilize e-learning (Lim, Lee, and Nam., 2007). PUF is the extent that individuals accept that utilizing a specific system will enhance their professional performance. Wu et al. (2006) found that perceived usefulness contributed altogether to the learners' goal to use a website. Lim et al. (2007) said numerous researchers give confirmations of the impact of PUF on the behavioral aim to use a studying framework. Perceived playfulness and PEU have an indirect positive influence on intention to use (Lim et al., 2007). PEU is the degree of an individual's trust that utilizing is free of effort. Lim et al. (2007) discussed that the primary component impacting students' learning performance relies on upon that it is so natural to utilize or approach a website. Quality of the learning environment and the ease of using an LMS additionally add to the performance and course satisfaction of an e-learning course (Tung and Chang, 2008).

Environmental Dimension

The environment of study does matter for student satisfaction. If the learners feel happy in their study environment, then it encourages them to apply more effort to get good out of their studies. E-learning has emerged as a new model of education in Pakistan. E-learning institutes must provide a collaborative environment for their students and instructors so that it will reduce the communication gap and bring them closer to each other. Also, apply different assessment methods to check the creativity and knowledge they are getting from a web-based learning environment. Here we can see what previous researchers thought about the e-learning environment; According to Selim (2007) environment in online learning can be perceived as college guidelines and assistance. Diversity in assessment comprises of social impacts, learner-perceived interaction with others, perceived self-governance assistance, and diversity in the assessment. Andresen (2009) found that learners require a motivating force to take an interest, proposing that the level of cooperation incorporated in the evaluation. Variables, i.e., diversity in the assessment and perceived interaction with others of the environmental dimension, remarkably affect e-learner's satisfaction (Thurmond et al., 2002). In e-learning, interactivity is an active component for building connections among students and instructors, and also among the students (Ozkan and Koseler, 2009). Structure of a dialog impacts learner interest, and like this, how they esteem the appraisal in the internet learning environment (Sun et al., 2008).

Methodology

Theoretical Framework

Based on the extensive literature review on six dimensions which are connecting with the e-learners' satisfaction, the following thirteen hypotheses were suggested, and they were previously utilized by (Sun et al., 2008).

H1: TRT positively influences on PELS in e-learning institutions.
H2: TAE positively influences on PELS in e-learning institutions.
H3: SAC positively influences on PELS in e-learning institutions.
H4: SCA negatively influences on PELS in e-learning institutions.
H5: SIE positively influences on PELS in e-learning institutions.
H6: TQ positively influences on PELS in e-learning institutions.
H7: IQ positively influences on PELS in e-learning institutions.
H8: ECF positively influences on PELS in e-learning institutions.
H9: ECQ positively influences on PELS in e-learning institutions.
H10: PUF positively influences on PELS in e-learning institutions.
H11: PEU positively influences on PELS in e-learning institutions.
H12: DA positively influences on PELS in e-learning institutions.
H13: LPIO positively influences on PELS in e-learning institutions.

Design and Sampling Technique

The current study categorizes as descriptive design research. We can describe descriptive design research to portray a circumstance. In this, we explain the present situation as opposed to making any judgments. The researcher used cross-sectional research design in this research because, in a cross-sectional design, we can collect information on variables at a solitary point in time. The sample collected through non-probability sampling, e.g., convenience sampling method. It was guaranteed that the individuals have two primary capabilities to take part in the survey. First, the individuals ought to have enough information about e-learning; second, they have been studying and/or studied previously in any e-learning institutes of Pakistan.

Target Population

The target population of this research was the students (current students as well as students who studied previously) in any e-learning institutes of Pakistan.

Data Collection

Data collected through a self-administered questionnaire. The questionnaire was designed to getting the desired information on PELS in e-learning institutes of Pakistan. The survey instruments based on two parts; the first part consists of demographic and personal information like an institute of study, gender, age, and education level. Second part includes on variables (perceived e-learner satisfaction, e-learning course flexibility, learners' perceived interaction with others, e-learning course quality, diversity in assessment, perceived usefulness, teachers' response time, perceived ease of use, students' internet self-efficacy, students' computer anxiety, technology quality, internet quality, teachers' attitude towards e-learning, students' attitude towards computer) of the study which contains seventy-two items which to be answered from five-point Likert scale consisting from strongly disagreed (1) to strongly agreed (5). To obtain information about critical factors that impact on learners' satisfaction; an aggregate of 250 self-administered questionnaires disseminated among the students of e-learning institutes of Pakistan through e-mails and by meeting personally to the students during their online in campus sessions. A total of 202 forms returned with a response rate of 80.8% of the survey completed within May 2019.

Respondents' Profile

Respondents' profile which comprises of institute of study, gender, age, and education level included in table 1

Table 1. Respondents' profile

Measures	Items	Frequency	Percentage %
Institute of study	COMSATS virtual campus	119	58.9
	Virtual university	76	37.6
	AIOU/Others	9	3.5
Gender	Male	124	61.4
	Female	78	38.6
Age	18-22	25	12.4
	23-27	69	34.2
	28-32	70	34.7
	33-37	23	11.4
	38-42	9	4.5
	43 and above	6	3.0
Education level	Undergraduate	33	16.3
	Graduate	84	41.6
	Postgraduate	79	39.1
	Other	6	3.0

Source: Source: Aftab, Sarwar, Khan, Kiran ., 2019

Cronbach's Alpha

To check the reliability of the collected data, Cronbach's alpha was utilized. Variable students' internet self-efficacy (0.96) had the highest value of α reliability coefficient whereas variable students' attitude towards computer (0.74) had the lowest value of α reliability coefficient and all other variables had also a satisfactory level of reliabilities as given in Table 2

Table 2. Reliability and source

Scales	Alpha (α)	Items	Source
Perceived e-learner satisfaction	0.95	9	(Arbaugh, 2000)
Students' attitude towards computer	0.74	8	(Gattiker and Hlavka, 1992)
Teachers' response time	N/A	1	(Thurmond et al., 2002)
Students' computer anxiety	0.86	4	(Barbeite and Weiss, 2004)
Teachers' attitude towards e-learning	N/A	1	(Webster and Hackley, 1997)
Students' internet self-efficacy	0.96	13	(Joo et al., 2000)
Technology quality	0.87	4	(Amoroso and Cheney, 1991)
Perceived ease of use	0.90	4	(Arbaugh, 2000)
Internet quality	0.85	4	(Sun et al., 2008)
E-learning course quality	0.81	3	(Arbaugh, 2000)
Learners' perceived interaction with others	0.92	9	(Arbaugh, 2000)
E-learning course flexibility	0.87	7	(Arbaugh, 2000)
Perceived usefulness	0.89	4	(Arbaugh, 2000)
Diversity in assessment	N/A	1	(Thurmond et al., 2002)

Source: Aftab et al ., 2019

Multiple Regression Analysis

To check the influence of six dimensions (technology, student, environmental, instructor, system design features, and course) had on PELs, multiple regression analysis was used, and the results are indicated in table 3.

H_1: TRT positively influences on PELS in e-learning institutions.

According to the outcomes of current research, the predictor variable teachers' response time has a positive and significant effect on criterion variable PELS with (β=0.259), (t=3.482), and (P<0.05). So, for each unit increment in teachers' response time, we anticipate a 0.259-points increment in the PELS. It validates H_1.

H_2: TAE positively influences on PELS in e-learning institutions.

According to the outcomes of current research, the predictor variable teachers' attitude towards e-learning has a positive and significant impact on criterion variable PELS with (β=0.187), (t=2.515), and

(P<0.05). So, for each unit increment in teachers' attitude towards e-learning, we anticipate a 0.187-points increment in the PELS. It validates H_2.

H_3: SAC positively influences on PELS in e-learning institutions.

According to the outcomes of current research, the predictor variable students' attitude towards computers has a positive and significant association with criterion variable PELS with (β=0.422), (t=5.699), and (P<0.05). So, for each unit increment in students' attitudes towards a computer, we anticipate a 0.422-points increment in the PELS. It validates H_3.

H_4: SCA negatively influences on PELS in e-learning institutions.

According to the outcomes of current research, the predictor variable students' computer anxiety has a negative and insignificant association with criterion variable PELS with (β=-0.046), (t=--0.724), and (P>0.1). So, for each unit increment in students' computer anxiety, we anticipate a 0.046-points decrement in the PELS. It does not support H_4.

Table 3. Coefficients

Variables	Unstandardized Coefficients		Standardized Coefficients		
	B	Std.Error	Beta	t	Sig.
Teachers' Dimension					
(Constant)	2.097	0.235		8.914	0.000
H_1:Teachers' response time (TRT)	0.224	0.064	0.259	3.482	0.001
H_2:Teachers' attitude towards e-learning (TAE)	0.172	0.068	0.187	2.515	0.013
Students' Dimension					
(Constant)	0.612	0.365		1.674	0.096
H_3:Students'attitude towards computer (SAC)	0.579	0.102	0.422	5.699	0.000
H_4:Students' computer anxiety (SCA)	-0.049	0.067	-0.046	-0.724	0.470
H_5:Students' internet self-efficacy (SIE)	0.233	0.085	0.221	2.740	0.007
Technology Dimension					
(Constant)	0.785	0.264		2.978	0.003
H_6:Technology quality (TQ)	0.575	0.075	0.519	7.698	0.000
H_7:Internet quality (IQ)	0.125	0.070	0.121	1.794	0.074
Course Dimension					
(Constant)	0.545	0.223		2.439	0.016
H_8:E-learning course flexibility (ECF)	0.620	0.083	0.536	7.451	0.000
H_9:E-learning course quality (ECQ)	0.211	0.079	0.192	2.671	0.008
Design Dimension					
(Constant)	0.374	0.202		1.848	0.066
H_{10}:Perceived usefulness (PUF)	0.557	0.084	0.516	6.657	0.000
H_{11}:Perceived ease of use (PEU)	0.276	0.082	0.262	3.377	0.001
Environmental Dimension					
(Constant)	0.701	0.210		3.340	0.001
H_{12}:Diversity in assessment (DA)	0.381	0.051	0.431	7.520	0.000
H_{13}:Learners' perceived interaction with others (LPIO)	0.403	0.061	0.379	6.625	0.000

Source: Aftab et al., 2019

H_5: SIE positively influences on PELS in e-learning institutions.

According to the outcomes of current research, the predictor variable students' internet self-efficacy has a positive and significant association on criterion variable PELS with (β=0.221), (t=2.740), and (P<0.05). So, for each unit increment in students' internet self-efficacy, we anticipate a 0.221-points increment in the PELS. It supports H_5.

H_6: TQ positively influences on PELS in e-learning institutions.

According to the outcomes of current research, the predictor variable technology quality has a positive and significant effect on criterion variable PELS with (β=0.519), (t=7.798), and (P<0.05). So, for each unit increment in technology quality, we anticipate a 0.519-points increment in the PELS. It justifies H_6.

H_7: IQ positively influences on PELS in e-learning institutions.

According to the outcomes of current research, the predictor variable internet quality has a positive but insignificant impact on criterion variable PELS with (β=0.121), (t=1.794), and (P>0.05). So, for each unit

increment in internet quality, we anticipate a 0.121-points increment in the PELS. It rejects H_7.

H_8: ECQ positively influences on PELS in e-learning institutions.
According to the outcomes of current research, the predictor variable course quality has a positive and significant impact on criterion variable PELS with (β=0.536), (t=7.451), and (P<0.05). So, for each unit increment in e-learning course quality, we anticipate a 0.536-points increment in the PELS. It justifies H_8.

H_9: ECF positively influences on PELS in e-learning institutions.
According to the outcomes of current research, the predictor variable course flexibility has a positive and significant impact on criterion variable PELS with (β=0.192), (t=2.671), and (P<0.05). So, for each unit increment in e-learning course flexibility, we anticipate a 0.192-points increment in the PELS. It justifies H_9.

H_{10}: PUF positively influences on PELS in e-learning institutions.
According to the outcomes of current research, the predictor perceived usefulness has a positive and significant impact on criterion variable PELS with (β=0.516), (t=6.657), and (P<0.05). So, for each unit increment in perceived usefulness, we anticipate a 0.516-points increase in the PELS. It justifies H_{10}.

H_{11}: PEU positively influences on PELS in e-learning institutions.
According to the outcomes of current research, the predictor perceived ease of use has a positive and significant association with criterion variable PELS with (β=0.262), (t=3.377), and (P<0.05). So, for each unit increment in perceived ease of use, we anticipate a 0.262-points increase in the PELS. It justifies H_{11}.

H_{12}: DA positively influences on PELS in e-learning institutions.
According to the outcomes of current research, the predictor diversity in assessment has a positive and significant effect on criterion variable PELS with (β=0.431), (t=7.520), and (P<0.05). So, for each unit increment in diversity in assessment, we anticipate a 0.431-points increment in the PELS. It justifies H_{12}.

H_{13}: LPIO positively influences on PELS in e-learning institutions.
According to the outcomes of current research, the predictor LPIO has a positive and significant effect on criterion variable PELS with (β=0.379), (t=6.625), and (P<0.05). So, for each unit increment in learners' perceived interaction with others, we anticipate a 0.379-points increment in the PELS. It justifies H_{13}.

Model Summary
The square root of R^2, referred to as R it is the correlation among predicted and observed values of the criterion variable. R-square indicates the total change in the criterion variable perceived e-learner satisfaction due to the influence of the predictor variables. The highest value of (R^2=0.548) at the predictor variables of design dimension, which meant 54.8% fluctuation in the criterion variable PELS was due to variables of this dimension, as shown in table 4.

Table 4. Model summary

Variables	R	R-Square	Adjusted R^2	Std.Error of the Estimates
Teachers' Dimension	0.384	0.148	0.139	0.96205
Students' Dimension	0.605	0.366	0.356	0.83194
Technology Dimension	0.591	0.350	0.343	0.84021
Course Dimension	0.684	0.468	0.463	0.75987
Design Dimension	0.740	0.548	0.544	0.70049
Environmental Dimension	0.687	0.472	0.467	0.75721

Source: Aftab et al., 2019

The lowest value of (R^2=0.148) at the predictor variables of teachers' dimension, which meant only 14.8% fluctuation in the criterion variable PELS, was due to the variables of teachers' dimension.

Other dimensions had the following values students' (R^2=0.366); technology (R^2=0.350); course (R^2=0.468) and environmental (R^2=0.472) as presented in table 4 of model summary.

ANOVA

Table 5 shows the ANOVA outcomes. We can find the value of f-stat by divided Regression/Residual of Mean Square, e.g., in teachers' dimensions, the f-value is equal to 15.940/0.926=17.222. The overall results demonstrate that the model is a good fit, and all six aspects (teachers', course, students,' design, technology, and environmental) had a p-value less than 0.05, which meant they are statistically significant.

Table 5. ANOVA

Variables	Sum of Squares	df	Mean Square	F	Sig.
	31.879	2	15.940	17.222	0.000
Teachers' Dimension	184.183	199	0.926		
	216.062	201			
	79.022	3	26.341	38.058	0.000
Students' Dimension	137.039	198	0.692		
	216.062	201			
	75.577	2	37.789	53.529	0.000
Technology Dimension	140.484	199	0.706		
	216.062	201			
	101.158	2	50,579	87.596	0.000
Course Dimension	114.904	199	0.577		
	216.062	201			
	118.416	2	59.208	120.665	0.000
Design Dimension	97.645	199	0.491		
	216.062	201			
	101.962	2	50.981	88.916	0.000
Environmental Dimension	114.099	199	0.573		
	216.062	201			

Source: Aftab et al., 2019

Correlation

Table 6 indicates the correlation between the criterion variable and predictor variables. The PUF (r = 0.723, p < 0.01) had the uppermost association to the criterion variable PELS. Additional predictor variables that meaningfully connected with the dependent variable were: SAC (r = 0.573, p < 0.01); SCA (r = - 0.228, p < 0.01); SIE (r = 0.512, p < .001); TRT (r = 0.347, p < 0.01); TAE (r = 0.309, p < 0.01); ECF (r = 0.670, p <0.01); ECQ (r= 0.566, 0.01); TQ (r = 0.582, p < 0.01); IQ (r = 0.395, p < 0.01); PEU (r = 0.669, p < 0.01); DA (r = 0.596, p < 0.01); LPIO (r = 0.567, p<0.01). All the aspects showed noteworthy associations with PELS.

Discussion

The discussion is based on the factors having an impact on learners' satisfaction in e-learning institutes of Pakistan. Those dimensions are technology, student, environmental, teacher, system design features, and course. In this study, the researcher formed 13 hypotheses for utilizing exact proofs. The outcomes of multiple regression analysis proved that eleven out of thirteen variables had powerful domination on the criterion variable, i.e., perceived e-learner satisfaction (PELS). In teachers' dimensions, teachers' response time had a positive and significant effect on PELS. Response time from teacher did affect the learners' achievement because if the teacher would not response to student queries promptly, then it will affect the student learning, and hence, it will change their behavior towards e-learning in a negative way. Teachers' attitudes towards e-learning had a positive and significant impact on perceived e-learner satisfaction. The effects of training exercises and students' satisfaction are affected by educators' attitude in taking care of learning exercises. This study finding also supports the outcome of previous studies (e.g., Smeets, 2005; Piccoli, Ahmad, and Ives, 2001; Webster and Hackley, 1997).

Table 6. Correlation

	PELS	TRT	TAE	SAC	SCA	SIE	TQ	IQ	ECF	ECQ	PUF	PEU	DA	LPIO
PELS	1													
TRT	.347**	1												
TAE	.309**	.473**	1											
SAC	.573**	.422**	.493**	1										
SCA	-.228**	-.149*	-.015	-.202**	1									
SIE	.512**	.399**	.361**	.640**	-.438**	1								
TQ	.582**	.486**	.403**	.636**	-.245**	.758**	1							
IQ	.395**	.201**	.297**	.454**	-.093	.501**	.529**	1						
ECF	.670**	.364**	.440**	.604**	-.214**	.657**	.723**	.466**	1					
ECQ	.566**	.307**	.351**	.465**	-.127*	.535**	.614**	.439**	.696**	1				
PUF	.723**	.420**	.353**	.624**	-.305**	.601**	.660**	.522**	.706**	.570**	1			
PEU	.669**	.449**	.431**	.666**	-.311**	.709**	.750**	.515**	.733**	.540**	.789**	1		
DA	.596**	.526**	.398**	.630**	-.289**	.693**	.691**	.493**	.657**	.549**	.691**	.735**	1	
LPIO	.567**	.264**	.324**	.332**	.064	.299**	.383**	.305**	.525**	.500**	.533**	.477**	.437**	1

Source: Aftab et al., 2019

**. significant at the 0.01 level *. significant at the 0.05 level

PELS: Perceived e-learner satisfaction; TRT: Teachers' response time; TAE: Teachers' attitude towards e-learning; SAC: Students' attitude towards computer; SCA: Students' computer anxiety; SIE: Students' internet self-efficacy; TQ: Technology quality; IQ: Internet quality; ECF: E-learning course flexibility; ECQ: E-learning course quality; PUF: Perceived usefulness; PEU: Perceived ease of use; DA: Diversity in assessment; LPIO: Learners' perceived interaction with others.

In students' dimensions, students' attitudes towards computer and students' internet self-efficacy had a positive and substantial influence on PELS in e-learning institutions of Pakistan. While student computer anxiety harmed perceived e-learner satisfaction, but it is insignificant. The results related to students' dimensions collaborate with the finding of (Arbaugh and Duray, 2002) except student computer anxiety, which is not supporting the outcomes of (Sun et al., 2008). The reason for the rejection of students' computer anxiety might be the availability of technology at very cheap rates all over Pakistan. In this digital world, computers are now available in almost every house, which reduced the students' anxiety towards it, and now they feel confident in using and doing work on it. In the technology dimension, technology quality had a positive reflective effect on PELS. Technology quality has a positive impact on learners' satisfaction (Ozkan and Koseler, 2009). Internet quality had an insignificant influence on perceived e-learner satisfaction. Pakistan is moving towards the IT world, but still, students cannot access the fast speed internet at a very low price because it is still expensive, which creates a problem for students in utilizing the internet for study purposes. It supports the results of (Sun et al., 2008).

Variables of course dimension, e-learning course quality, and e-learning course flexibility, had a positive and significant impact on PELS. The findings of this research are related to (Sun et al., 2008; Arbaugh and Duray, 2002). Students adopt e-learning due to its flexibility feature because it allows them to take the class at any time and any place. Furthermore, it also allows them to manage their time more effectively, efficiently, and the Internet permits them to spend more time on non-related activities. Similarly, course quality has its importance. Nowadays, many institutes do offer the same courses which e-learning institutes are offering if e-learning institutes course quality does not match with other institutes quality than it is challenging to compete with them.

The design dimension had perceived usefulness and perceived ease of use (PEU) as predictor variables. Both of predictor variables had a positive and significant impact on PELS. Perceived usefulness results support the finding of (Arbaugh and Duray, 2002; Sun et al., 2008). While perceived ease of use findings support the results of (Sun et al., 2008), who argued that PEU firmly collaborated with students' satisfaction with e-learning. Students are diverting from conventional learning to e-learning in Pakistan. E-learning requires an online system to learn and interact if the online system would be easy to utilize than students will feel better and comfortable to use it. When learners think that

the web-based allow them to do what they want to do, moreover enhance their productivity and performance than it positively influences learners' attitude towards the system.

The environmental dimension had learners' perceived interaction with others, and diversity in the assessment as predictor variables, and both had a massive effect on criterion variable PELS in e-learning institutions of Pakistan. The outcomes of diversity in assessment support the findings of (Thurmond et al., 2002). When there would be different methods for assessing the e-learning effectiveness, then it will enhance the learners' performance, and also, they feel better about their knowledge. In this digital and social media world, everyone feels happy and better when they interact with their colleagues and friends. E-learning also follows this idea of interaction. Students can communicate with one another and even with their instructor. Online communication allows students to interact with different culture of students which enhance their confidence and trust in the online system. That's why these predictor variables positively influence PELS.

Conclusion and Suggestions

E-learning has become the ideal way of education for Pakistani students because it provides the opportunity to get themselves educated at a very low price and without the limitation of time and place. This study was carried out on students of e-learning institutes of Pakistan to check the influence of critical factors has on learners' satisfaction. For this purpose, an aggregate of 250 survey questionnaires was disseminated among the students of e-learning institutes of Pakistan, and 202(80.8%) samples were returned in which 124 (61.4%) were males, and 78 (38.6%) were females. The sample collected through a convenience sampling method. Multiple regression analyses directed to inspect the data. Outcomes demonstrate that eleven out of thirteen variables had a significant influence on perceived e-learner satisfaction (PELS), while student computer anxiety and internet quality had an insignificant impact on PELS with e-learning institutes of Pakistan. The reason for the rejection of students' computer anxiety might be the advancement of technology at a low price. In this digital world, the availability of computers at an affordable price has enhanced the confidence of students. Now, they feel more confident and comfortable while working on it. But still, students cannot access the fast speed internet in many rural areas at a low price because of a lack of coverage and comparatively high cost, which is still a hurdle for students in utilizing the internet for educational purposes. This study gives experiences to foundations to fortify their e-learning executions, and it will help the students to enhance their learning satisfaction. These thirteen elements can't be disregarded when executing a productive e-learning environment to enhance learner satisfaction and further reinforce their e-learning usage.

Limitations and Future Direction

The current research was carried out on major e-learning institutes of Pakistan. So, the outcomes of this research might be different for the results of developed countries' e-learning institutes. Moreover, this research was about the factors which impact on learners' satisfaction in e-learning institutes of Pakistan, but the future study will be a comparative study to measure the satisfaction between the e-learners' and regular students of major universities of Pakistan.

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References

A. McLeod, S. Pippin, R. Mason (2009). Individual taxpayer intention to use tax preparation software: examining experience, trust, and perceived risk. *Journal of Information Science and Technology,* 6 (1), 25–44.

Akhter, N., Saleem, K., & Kausar, F-Awan. (2015). An exploratory study of the problems faced by the district teacher educators (dates) regarding their professional experiences in primary schools of Punjab. *Pakistan Journal of Education, 32(1),* 1-20.

Al-Busaidi, K.A. (2012). Learners' perspective on critical factors to LMS success in blended learning: An empirical investigation. *Communications of the Association for Information Systems*, 30(2), 42-56.

Allen, I. E., & Seaman, J. (2010). Class Differences: Online Education in the United States, 2010. *Sloan Consortium (NJ1)*.

Arbaugh, J. B. (2002). Managing the on-line classroom: a study of technological and behavioral characteristics of web-based MBA courses. *Journal of High Technology Management Research,* 13, 203–223.

Arbaugh, J. B., & Duray, R. (2002). Technological and structural characteristics, student learning, and satisfaction with web-based courses an exploratory study of two on-line MBA programs. *Management Learning*, 33(3), 331-347.

Bolliger, D. U., & Halupa, C. (2012). Student perceptions of satisfaction and anxiety in an online doctoral program. *Distance Education*, 33(1), 81-98.

Cheng, Y.Y. (2012). Effects of quality antecedents on e-learning acceptance, *Internet Research*, 22(3), 361–390.

Chiu, C. M., Hsu, M. H., Sun, S. Y., Lin, T. C., & Sun, P. C. (2005). Usability, quality, value, and e-learning continuance decisions. *Computers & Education*, 45(4), 399-416.

Dennen, V. P., Darabi, A. A., & Smith, L. J. (2007). Instructor–learner interaction in online courses: The relative perceived importance of particular instructor actions on performance and satisfaction. *Distance Education,* 28, 65–79.

Ho, L.A., and Kuo, T.H. (2010). How can one amplify the effect of e-learning? An examination of high-tech employees'" computer attitude and flow experience. *Computers in Human Behavior,"* 26.

Iqbal, M. J., & Ahmad, M. (2010). Enhancing the quality of education through e-learning: the case study of Allama Iqbal Open University. *Turkish Online Journal of Distance Education*, 11(1). 26-35.

Katz, Y. J. (2002). Attitudes are affecting college students' preferences for distance learning. *Journal of Computer Assisted Learning*, 18, 2–9.

Khan, B. (2005). Learning features in an open, flexible, and distributed environment. *AACE Journal*, 13(2), 137-153.

Liang, J. C., & Tsai, C. C. (2008). Internet self-efficacy and preferences towards constructivist internet-based learning environments: A study of pre-school teachers in Taiwan. *Educational Technology & Society,* 11(1), 226-237.

Liaw, S. S., Huang, H. M., & Chen, G. D. (2007). Surveying instructor and learner attitude towards e-learning. *Computers Education*, 49(4), 1066–1080.

Lim, H., Lee, S. G., & Nam, K. (2007). Validating E-learning factors affecting training effectiveness. *International Journal of Information Management*, 27(1), 22-35.

McGorry, S. Y. (2003). Measuring quality in online programs. *The Internet & Higher Education*, 6, 159–177.

Noel-Levitz (2011). *National online learners' priorities report.* Retrieved from http://www.noellevitz.com/upload/Papers_and_Research/2011/PSOL_report.

Ong, C. S., & Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Computers in Human Behavior*, 22(5), 816-829.

Ozkan, S., & Koseler, R. (2009). Multi-dimensional students' evaluation of e-learning systems in the higher education context: An empirical investigation. *Computers & Education*, 53(4), 1285-1296.

Papp, R. (2000). Critical success factors for distance learning. *AMCIS 2000 Proceedings*, 104-127.

Perry, E. H., & Pilati, M. L. (2011). Online learning. *New Directions for Teaching and Learning*, 2011(128), 95-104.

Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skills training. *MIS quarterly*, 401-426.

Press. Andresen, M. A. (2009). Asynchronous discussion forums: success factors, outcomes, assessments, and limitations. *Educational Technology and Society,* 12(1), 249-257.

Rezaei, M., Mohammadi, H. Asadi, A., & Kalantary, K. (2008). Predicting e-learning application in agricultural higher education using the Technology Acceptance Model. *Turkish Online Journal of Distance Education,* 98(1), 85-95.

Sahin, I., & Shelley, M. (2008). Considering students' perceptions: The distance education student satisfaction model. *Educational Technology & Society*, 11(3), 216-223.

Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education,* 49(2), 396-413.

Shee, D. Y., & Wang, Y. (2008). Multi-criteria evaluation of the web-based e-learning system: A methodology based on learner satisfaction and its applications. *Computers & Education*, 50, 894–905.

Smeets, E. (2005). Does ICT contribute to powerful learning environments in primary education? *Computers & Education*, 44, 343–355.

Sun, P. C., Chen, Y. Y., Finger, G., Tsai, R. J., & Yeh, D. (2008). What drives successful eLearning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, 50, 1183-1202.

Thurmond, V. A., Wambach, K., & Connors, H. R. (2002). Evaluation of student satisfaction: Determining the impact of a web-based environment by controlling for student characteristics. *The American Journal of Distance Education,* 16(3), 169–189.

Tung, F.C., & Chang, S.C. (2008). An empirical investigation of students' behavioral intentions to use online learning course websites. *British Journal of Educational Technology,* 39(1), 71-83.

Wang, Y. S. (2003). Assessment of learner satisfaction with asynchronous electronic learning systems. *Information & Manageme*nt, 41(1), 75-86.

Webster, J., & Hackley, P. (1997). Teaching effectiveness in technology-mediated distance learning. *Academy of Management Journal*, 40(6), 1282–1309.

Wickersham, L. E., & McGee, P. (2008). Perceptions of satisfaction and deeper learning in an online course. *Quarterly Review of Distance Educ*ation, 9(1), 73-83.

Wu, J. H., Hsia, T. L. & Tennyson, R. D. (2010). A study of student satisfaction in a blended eLearning system environment. *Computers & Education*, 55, 55-164.

Wu, J. P., Tsai, R. J., Chen, C. C., & Wu, Y. C. (2006). An integrative model to predict the continuance use of electronic learning systems: hints for teaching. *International Journal on E-Learning*, 5(2), 287–302.

Yang, F., & Wang, S. (2014). Students' perception toward personal information and privacy disclosure in e-learning. TOJET: *The Turkish Online Journal of Educational Technology*, 13(1), 207–216.

Yang, Y., and Lin, N.C. (2010). Internet perceptions, online participation, and language learning in Moodle forums: A case study on nursing students in Taiwan. *Procedia Social and Behavioral Sciences*, 27, 66-78.

Yukselturk, E., & Yildirim, Z. (2008). Investigation of interaction, online support, course structure, and flexibility as the contributing factors to students' satisfaction in an online certificate program. *Educational Technology & Society*, 11(4), 51-65.

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