PJERE, December 2021, Vol. 9, No. 2, pp.76-94

Interactivity of E-Service Quality, Students' Collegiate Stress and Academic Efficacy: The Moderating Role of Motivation to Learn

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KEY WORDS

Interactivity of E-Service Quality, Students' Satisfaction, Collegiate Stress, in Academic Efficacy, Motivation to Learn

ABSTRACT

E-service quality and students' retention has become a critical component of competitiveness in higher education. There are many factors associated with effective e-services but interactivity is assumed as one of the most significant factors in education sector. Higher education institutes are investing lucrative resources to increase the efficiency and effectiveness of e-services to attract and retain students. The quantitative study was designed, first to see the relationship between interactivity of e-service quality and students' collegiate stress, academic efficacy and motivation to learn. A sample of 430 students from private sector higher education institutes (universities) was selected from district Lahore by simple random sampling. The students' perception about interactivity of e-service quality was measured by adopting a dimension from e-SQ (e-Service Quality) proposed by Al-Nuaimi, Mahmood, & Jebur, (2014). The students' collegiate stress, motivation to learn was measured through adopting a dimension from College Persistence Questionnaire (CPQ) developed by Davidson, Beck, Grisaffe, & Practice, (2015). The study suggests that interactivity of e-SQ had completely non-significant association with motivation to learn, collegiate stress

and academic efficacy among university students. On the other hand, motivation to learn held a significant relationship with collegiate stress of the students. Furthermore, motivation to learn had highly non-significant correlation with academic efficacy of the students. Lastly, academic efficacy of the students was also non-significant in relationship with collegiate stress of the students.

Introduction

E-Service Quality

E-services have become critical competitive component for high education institutions, especially for achieving SDG-goals for higher education and dealing with emergencies and uncertainties. They are striving to provide administrative and academic efficient e-services to reduce the employees' workloads and improved students' motivation to learn e.g, such as enrolment, course delivery, course support, and library lending (Sutarso, Suharmadi, & Information, 2011). Also, continuously improving web portals are provided for information and applications ensuring quality to achieve the satisfaction of the students.

Service quality is described as how well a service is delivered to the maximum extent of the customers' expectations and satisfaction (Sharma, Luk, & Chen, 2012). If the service is provided through some internet and computer-based source, it is described as electronic or e-service quality. It was first introduced by Zeithaml, Parasuraman and Malhotra, (2000) as "the extent to which a web site facilitates efficient and effective shopping, purchasing and delivery". E-services have become one of the core competitive business components in the emerging quality trends in almost every service or production sector. Therefore, its significance cannot be ignored in higher education, where reaching every learner anywhere and anytime has become one of the competitive components of higher educational institutions. The higher educational institutions are in a state of competition to provide efficient, secure, reliable and promising e-services to prove themselves more technologically equipped, adaptable to attract maximum students across the globe. Almost all production and service-based businesses are relying on the efficient updates of their e-services. Similarly, the higher educational institutions are investing their lucrative investments on improving interaction with the students and developing reliability, branding through technology to increase students' motivation. This approach towards providing services not only saves their economic resource and time but also generates greater revenues (Alzoubi, Abdo, Al-Gasaymeh, Alzoubi, & Research, 2019).

Higher educational institutes are facing several challenges in terms of adaption of e- service quality which has become one of the important

predictors of successful and quality academic services for keeping the students informed (Kim-Soon, Rahman, & Ahmed, 2014). E-service quality is defined as 'the extent to which website facilitates are efficient and effective and satisfying consumers' needs without meeting them physically (Zeithaml, Parasuraman, & Malhotra, 2002). E-service quality is also differentiated from the traditional service quality concept in terms of cost structure of services, the high degree of out-sourcing, rapid development of new services, the availability of transparent service feedback, and continuous improvement of services (Riedl et al., 2009).

The higher educational institutions are providing several updated and efficient academic and administrative e-services e.g.; in enrollment, course delivery, course support, library lending (Kim-Soon et al., 2014), say that online and off-line database WebCT, Blackboard are e-learning tools, or services, such as a virtual help desk, provided via a network, such as a local area network, intranet, are provided (Mirza, Mahmood, & Review, 2012) to facilitate the students and to optimize the administrative processes by reducing the workloads(Kim-Soon et al., 2014).

The emerging trends in technological adaptation and environmental uncertainties have forced the production and service sector business to improve their technological efficiency in their e-services to increase the accessibility and satisfaction of their stakeholders. (Kim-Soon et al., 2014). This shift has also forced the higher educational institutes to adapt the best e-services resources to add value to their students learning. The internet has proved as one of the sources for ensuring the quality of e-services and educators are preparing themselves accordingly. Moreover, Sustainable Development Goals-4 (SDG-4) for making education equitable and accessible with anywhere and anytime approach has lead the countries to expand higher education without compromising on quality (Heleta & Bagus, 2021)

The best demonstration of increased significance of e-services quality is the spread COVID-19, which caused sudden shift of on campus to online education system all over the world. The world's best universities including Harvard, Oxford and Cambridge were shut down and switched towards their e-services to keep the educational processes smooth (Demir, Maroof, Khan, & Ali, 2020). Some were quite successful and their students were observed satisfied while a few were unable to adapt to these technological resources because of several reasons and their students were observed confused and perplexed. Such unpredictable situations have increased the dependency of higher educational institutes on e-services quality.

Many researchers (Al-Mushasha & Nassuora, 2012; Carlson & O'Cass, 2012; Kim-Soon et al., 2014) have identified that higher education is scarcely researched in terms of e-services and its effects on students. Moreover, the available researchers are conducted in developed countries (Pham, Limbu, Bui, Nguyen, & Pham, 2019) but the developing countries are

observed lagging behind in achieving required level of e-service quality at higher education (Jameel, Hamdi, Karem, & Raewf, 2021; Landrum, Bannister, Garza, & Rhame, 2021). Seeing this research gap, the current study was designed to explore the relationship between interactivity of e-services' quality, students' collegiate stress, academic efficacy and moderating role of motivation to learn.

Objectives of the Study

The study aimed at the following objectives

1. To identify the relationship between the interactivity of e-service quality, students' collegiate stress and their academic efficacy at higher education
2. To explore the moderating role of motivation to learn between students' collegiate stress and their academic efficacy at higher education

Theoretical Background

The study is based on the theory of interactive constructivism presented by John Dewey who believed that it is essential for educators to understand the value of interaction with learners in formal and informal learning environment learn to better interact with their environment. The focus of all educational institutes is to ensure quality teaching and learning for which they emphasize on providing the services which are interactive as supported by several researches that learning becomes less effective if the students feel isolated and less connected with real world environment (Zhu & Baylen, 2005).

Literature Review

E-Service Quality in Higher Education

E-services are supposed to be more efficient and interactive than the traditional services to achieve the maximum satisfaction of the customers (Li, Suomi, & Technology, 2009). Seeing its increased significance, researchers have investigated different models to increase the quality of e-services for enhancing profitability (Cronin, 2003). SERVQUAL by Parasuraman, Zeithaml, and Berry (1988) have investigated on five dimensions, whereas from Dabholkar (1996) identified 7 dimensions of e-service quality, while Donthu (2001) introduced four dimensions scale (SITEQUAL) and Cox and Dale (2001) presented a scale of e-service quality with six dimensions. Moving forward, Lonciacono et al (2002) developed WEBQUAL which comprised of 12 dimensions and Wolfinbarger and Gilly (2002) established COMQ. SERVQUAL by Parasuraman, Zeithaml, and Berry (1988) with five dimensions (1) reliability, (2) responsiveness, (3) assurance, (4) empathy, and (5) tangibles. While Zeithaml (2000) recommended amendments in traditional SERQUAL with seven dimensions of e-service quality (E-S-QUAL). There are many others in process which show the high significance

of improving e-service quality in almost every production and service sector. The history of research shows that higher education sector has scarcely been researched in this context. In education sector, higher education has become very competitive in terms of providing quality services to retain and attract students.

Almost all the dimensions are being applied in research in higher education to improve the e-service quality. The present study applied one dimension proposed by e-SQ (e-Service Quality) developed by Al-Nuaimi, Mahmood, & Jebur, (2014) seeing because of its contemporary components assumed it to be more practical in higher educational institutes, prepared for an educationally developing country (Malaysia). The e-SQ is comprised of nine dimensions; efficiency, availability, security, fulfillment, reliability, web design, interactivity, information and responsiveness. The dimension interactivity is adopted to dig deep how interactivity of e-service quality is associated with students Collegiate Stress and Academic Efficacy.

Interactivity of E-Service Quality

Interactivity is the process of working between two people or things and influencing each other and is defined as an inclusive construct that is related to both traditional mass media and computer-mediated communication (Quiring & Schweiger, 2008). Featherman and Wells, (2010) explained that it is the experience of the consumer adoption that makes a service valuable. If the service provider has made it concrete in such a way that consumer perceives it as tangible and real, then it enhances its satisfaction. Al-Nuaimi, Mahmood, & Jebur, (2014) have seen this as the "degree of interaction between service provider and the user as it helps to grasp and track the procedures on the required services". They assumed that enhancing interactivity of e-service quality depicts as positive perception of users and they feel more motivated to learning and retention. Therefore, in this study it is assumed that if the students experience e-services interactive, they feel motivated to learn and this decreases their colligate stress. Several researches have been conducted on the interactive physical learning environment at different educational level but studies are rare on how e-services can enhance this sense of interaction and can contribute in students' motivation to learn, decreases their colligate stress and increase their academic efficacy.

Some studies are available but with contrary findings e.g., Kara, Tanui, and Kalai (2016) identified ten dimensions of quality services; quality of teaching facilities, quality of library service environment, provision of internet services, availability of text books in libraries in the universities, administrative service quality, lecturer quality, quality of instructional practices, reliability of university examinations, perceived learning gains and quality of students' welfare services. They found all the services were positively related to students' satisfaction but internet services were directly and negatively related to students' satisfaction.

Dickinger and Stangl (2013) have identified eight components of website quality "System availability, ease of use, usefulness, navigational challenge, website design, content quality, enjoyment, and trust".

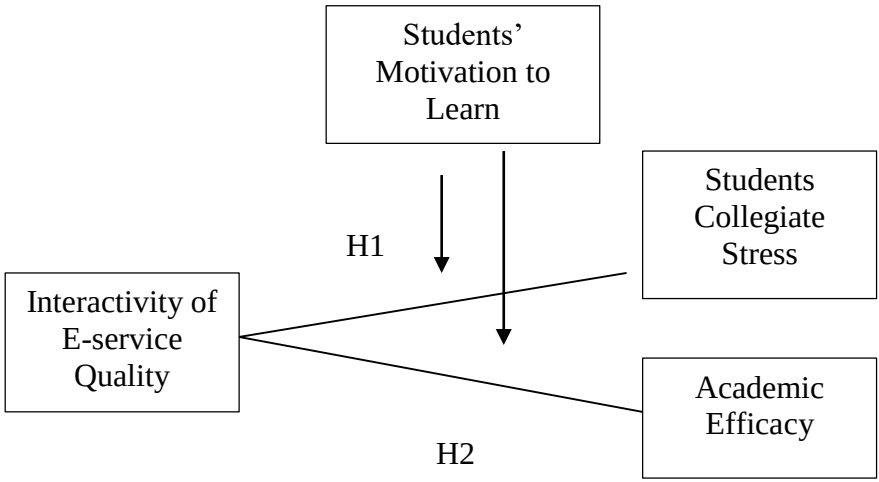
Students' Collegiate Stress

Stress among the students is the most prevailing expression among the students at higher education institutes which influences their retention at higher educational institutes. Many factors are observed associated with students' stress at higher education levels e.g. educational unpreparedness, financial strain and inability to integrate socially causes withdrawal from studies. (Harris, Campbell Casey, Westbury, & Florida-James, (2016). They found that although stress was found associated with the retention intention but some coping mechenism works and they actually do not withdraw. Students' retention at higher education has become the one of the complex factor to achieve by the administrators. The administrators have reported the early withdrawl by many students, demaging their emotional welbeing and professional growth, and decreasing concentration on learning (Harris et al., 2016; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Lipson, Lattie, & Eisenberg, 2019). A study conducted by Lipson, Lattie, & Eisenberg, (2019) reported that students' number with stress has been in rapidly increasing since the last few decades. Existing studies are focusing on the identifcation of issues associated with instituional factors and students' retention e.g; university campus size, type of course structure (full- or part-time), resources, quality teaching, individual characteristics such as gender, entry qualifications, personality, social support, competing commitments, living situation, financial status, academic performance/ability, engagement, self-efficacy and the chosen subject (Devonport & Lane, 2006; Mahmoud, Staten, Hall, & Lennie, 2012)

Students' Academic Efficacy

Bandura (1997) described self-efficacy as a trait which gives people a confidence to achieve the assigned task. He also suggested that student's high self-efficacy support in completion of complex tasks. Similarly, students' academic efficacy is described as the students' self-beliefs toward their capabilities to achieve academic success by effective learning material. Students' academic efficacy is proved to be closely associated with their academic achievement in various researches (Edman & Brazil, 2009). Ample research data is available on how the use of technology influences the student's success by increasing their academic efficacy (Lacka, Wong, & Haddoud, 2021; Shank & Cotten, 2014). As, rare research is available on how quality of e-services influence students' academic efficacy, therefore, to fill the gap in research, is study was designed to explore the relationship between e-service quality and students' academic efficacy.

Students' Motivation to Learn



Hypotheses

Ho1: There is significant relationship between interactivity of the e-service quality and students' collegiate stress

H_O2: There is significant relationship between interactivity of the e-service quality and academic efficacy

H_O2: The students' motivation to learn moderates between interactivity of the e-service quality, collegiate stress and academic efficacy

Methodology

The quantitative research strategy was adopted to explore the relationship between the variables. A sample of 432 university students was selected through simple random sampling from private higher education institutions from the district of Lahore, Pakistan. The revised version of Multifactor Leadership Questionnaire, 5x rater form, developed by Bass and Avolio in

1995, was adopted to assess the teachers' perceptions about their school leaders' leadership behaviors. The questionnaire comprised of two sections. Section I consisted of demographics (age, experience and education) details of the students while section II comprised of three adopted scales The students' perception about interactivity of e-service quality was measured by adopting a dimension from e-SQ (e-Service Quality) proposed by Al-Nuaimi, Mahmood, & Jebur, (2014). The students' collegiate stress, motivation to learn was measured through adopting a dimension from College Persistence Questionnaire (CPQ) developed by Davidson, Beck, Grisaffe, & Practice, (2015). The study suggests that interactivity of e-SQ had completely non-significant association with motivation to learn, collegiate stress and academic efficacy among university students. The sample was ensured the confidentiality of the data.

Significance of the Study

Exploring students' perceived satisfaction on the provided services at higher education is critical for the retention and enrolment of the students in different degree programs. This has become more important in case of e-service quality as it has become one of the resource for the expansion of higher education to remote areas and across borders.

Results and Analysis

Demographics

Empirical data collected through self-administered survey comprised of a total of 430 participants from various public and private higher education institutions (universities) across the district of Lahore. Results showed that approximately 54% students were females and 46% of the respondents were males. Around 39% of participants belonged to the age group of 18-20 years of age bracket, 57% of the total sample respondents represented age group of 21-23 years, while only 2% of the students belonged to the age bracket of 24 years and above. With regard to the educational qualification, approximately 13% students were currently enrolled in 16 year Master's programs, 77% students were studying Bachelor (Hon's) programs, while only 10% of the students were currently registered in 18 year MS programs. 71% of students had their representation from public universities, contrarily, 29% of the total study respondents had their representation from private universities. Demographic results showed that 17% of the university participants belonged to professional degree of Computer Science and Engineering, 62% students opted the professional degree of Social Sciences and Humanities, and 21% of the respondents belonged to the professional field of Business and Management. The results of the demographic section are summarized in Table 1 given below:

Table 1:
Results of Demographic Section

Sr. #	Demographic Items		
		Frequency	**Percentage**
1	**Gender**		
		199	46%
		231	54%
	Male		
	Female		
1	**Age Group**		
	18-20 years	169	39%
	21-23 years	252	59%
	24 years & above	9	2%
3	**Qualification**		
	Bachelor Hon's	332	77%
	Masters 16 years	54	13%
	Masters 18 years	44	10&
4	**Sector**		
		307	71%
	Public	123	29%
	Private		
5	**Professional Degree**		
	Computer Science & Engineering	74	17%
	Social Sciences & Humanities	268	62%
	Business and Management	88	21%
	Total (N)	**430**	**100%**

Descriptive Statistics

The results of the descriptive statistics involving mean and standard deviation values of each construct i.e. website interactivity, students' motivation to learn, students' collegiate stress, and student's academic efficacy are shown below in Table 2. The mean and standard deviation values of data collected from students for their website interactivity were reported as 4.076 and 0.467 respectively. The mean value for students' motivation to learn was 4.136 with standard deviation of 0.781. Collegiate stress of the students were assessed on the mean value of 4.396 and standard deviation of 0.919. Lastly, the mean and standard deviation for academic efficacy of the students were recorded as 4.707 and 1.038 respectively.

KMO Indexes Assessing Sample Fitness

Exploratory factor analysis was conducted to determine the KMO indexes for all the four constructs in order to the sample adequacy of each. The results of the analysis are summated in Table 2 on page 12 and can be seen that the KMO index for website interactivity of the service quality was $0.828 > 0.5$ ($p<0.05$), validating the appropriateness of the collected data. Similarly, the KMO values for students' motivation to learn, their collegiate stress and academic efficacy were found to be 0.761, 0.733 and 0.738 effectively. All the values of KMO were greater than 0.5 ($p<0.05$) and thus established the empirical evidence that the sample data were adequate for determining the model fit and analyzing the relationship.

Reliability Analysis

The inter-item consistency for instruments of each of the four constructs was separately determined using Reliability analysis derived upon their Cronbach's Alpha Coefficients. The results are shown in Table 2 on page 12. As it can be seen that for the construct of interactivity of the service quality, the Cronbach's Alpha value is 0.830. For Students' motivation to learn, the internal consistency among the items based on Cronbach's Alpha is 0.824. The reliability coefficient of the collegiate stress of the students is 0.811. Lastly, the inter-item consistency coefficient of students' academic efficacy is 0.767. All the coefficient values are above 0.7 indicating that the items for each of the four constructs are highly reliable and consistent to measure the variable.

Correlation Analysis

Correlation analysis was applied to examine the level of significance of the relationship/association among all variables taken into consideration for the intended study. Upon conducting analysis, the empirical results of the data revealed that website interactivity held completely non-significant relationships with motivation to learn ($r = -0.041$, $p = 0.396 > 0.05$), collegiate stress ($r = -0.089$, $p = 0.066 > 0.05$) and academic efficacy ($r = 0.034$, $p = 0.482 > 0.05$). Motivation to learn held a significant correlation with collegiate stress ($r = 0.351$, $p = 0.000 < 0.01$), such that motivation to learn had a 35% positive and noteworthy relationship with collegiate stress of the students. On the other hand, motivation to learn was having a highly non-significant

relationship with academic efficacy of the students (r = 0.046, p = 0.338 > 0.05). Lastly, academic efficacy of the students was also non-significant in relationship with collegiate stress of the students (r = 0.060, p = 0.211 > 0.05). The results of correlation analysis are also exhibited in Table 2 shared below:

Table 2
The results of correlation

Constructs	Website Interactivity	Motivation to Learn	Collegiate S
Website Interactivity	-----		
Motivation to Learn	-0.4%	-----	
Collegiate Stress	-0. 9%	35.1%*	-----
Academic Efficacy	0.3%	0.5%	0.6%
N	430	430	430
Mean	4.076	4.136	4.396
Std. Deviation	0.467	0.781	0.919
Reliability	0.830	0.824	0.811
KMO Index	0.828	0.761	0.733

* p value < 0.01

Moderated Regression Analyses

Motivation to Learn as Moderator between Website Interactivity and Collegiate Stress

Hierarchical moderation regression analysis was conducted to extract the analytical findings based on two basic and two interaction models. Results of the moderation regression analysis are shown in the Table 3 below. Firstly, the direct effect of website interactivity on students' collegiate stress was studied using basic model followed by the interaction effect of website interactivity on collegiate stress moderated by the motivation of students to learn based on model 2. Hierarchical regression analysis helps estimate the 'Basic Model' as well as the 'Interaction Model' after confirming the six key assumptions of regression, and moderation analysis was conducted through Macro Process based on approach of Model 1.

The results of the analysis showed that the exogenous or predictor variables i.e. website interactivity had an non-significant effect on the criterion or dependent variable i.e. collegiate stress of students (β = 0.095, p-value = 0.066 > 0.05). Similarly, the moderated effect of website interactivity on collegiate stress was also found to be non-significant i.e. β = -0.146, p-value = 0.101 > 0.05, Proceeding with the 'Interaction Model' based on the interaction relationship between the predictor variable (x) and moderating variable (z)

such that restrictive relationship between website interactivity and collegiate stress moderated by motivation to learn was studied. Contrarily, the moderating variable i.e. motivation to learn (WI_x_MTL) exerted a straight significant effect on the collegiate stress of the student having $\beta = 0.410$, p-value = 0.000 < 0.05 displaying an evidence on the presence of a consequential and significantly positive conditional role of the moderator i.e. motivation to learn in relationship between website interactivity and students' collegiate stress. It is concluded that besides the existence of student's high-level interactivity on websites in district of Punjab, accompanied by their greater motivation and drive to learn, their collegiate stress significantly increased. The increase in R^2 change value ($\Delta R^2 = 0.346$, p-value = 0.016) based on decisive impact authorizes the dense moderating effect of learning motivation of the students with regard to their interaction or usage of website and the resultant stress they face in the university. However, it was also revealed that website interactivity does not have any direct momentous role in maximizing the students' collegiate stress. The results based on the empirical evidence are illustrated in the Table 3 shown below:

Table 3

Direct and Interaction Effects

Independent Variable	**Basic Model 1**		**Interaction Model 1**	
	B	**t**	**B**	**T**
Intercept (α)	5.107*	13.142*	3.297*	7.603*
X (β_1)	-0.174	-1.841	-0.146	-1.645
Z (β_2)	0.410*	7.706*	0.439*	9.136*
X_x_Z (β_3)			0.571*	11.105
R^2	0.008		0.129	
Adjusted R^2	0.006		0.125	
F	3.390		31.617	
ΔF	3.390		59.381	
ΔR^2			0.121	

*****p-value < 0.05

Motivation to Learn as Moderator between Website Interactivity and Academic Efficacy

Hierarchical moderation regression analysis was executed to extract the analytical findings based on two basic and two interaction models. Results of the moderation regression analysis are shown in Table 4 below. Firstly, the direct effect of website interactivity on students' academic efficacy was studied using basic model followed by the interaction effect of website interactivity on academic efficacy moderated by the motivation of students to learn based on model 2. Hierarchical regression analysis help estimate the 'Basic Model' as well as the 'Interaction Model' after confirming the key six

key assumptions of regression, and moderation analysis was conducted through Macro Process based on approach of Model 1.

The results of the analysis showed that or predictor variable i.e. website interactivity had an non-significant effect on the criterion variable i.e. academic efficacy of students ($\beta = 0.076$, p-value = 0.482 > 0.05). Similarly, the moderated effect of website interactivity on academic efficacy was also found to be non-significant i.e. $\beta = 0.080$, p-value = 0.457 > 0.05, Proceeding with the 'Interaction Model' based on the interaction relationship between the independent or predictor variable (x) and the contingency or moderating variable (z) such that restrictive relationship between website interactivity and academic efficacy moderated by motivation to learn was studied. Similarly, the regulating or moderating variable i.e. motivation to learn (WI_x_MTL) also showed non-significant effect on the academic efficacy of the student having $\beta = -0.139$, p-value = 0.165 > 0.05 displaying an evidence on the absence of any consequential and significantly conditional role of the moderator i.e. motivation to learn in relationship between website interactivity and students' academic efficacy. Henceforward, it is concluded that besides the existence of student's high level interactivity on websites in the district of Punjab, accompanied by their greater motivation and drive to learn, their academic efficacy remain unchanged. The increase in R^2 change value ($\Delta R^2 = 0.002$, p-value = 0.323) based on indecisive and inconsequential impact shows the nonappearance of the moderating effect of learning motivation of the students with regard to their interaction or usage of website and the resultant academic efficacy they develop in the university. However, it was also revealed that website interactivity neither has any direct momentous role in maximizing the academic efficacy of students, nor their motivation to learn is pivotal to sustain the effect of website interactivity of these students on their academic efficiency and efficacy. The results based on the empirical evidence are illustrated in the Table 4 shown below:

Table 4

Direct and Interaction Effects

Independent Variable	**Basic Model 1**		**Interaction Model 1**	
	B	**t**	**B**	**t**
Intercept (α)	4.399	9.985	4.118	7.858
X (β_1)	0.076	0.704	0.080	0.744
Z (β_2)	0.064	0.989	0.059	0.954
X_x_Z (β_3)			-0.139	-1.2133
R^2	0.003		0.006	
Adjusted R^2	0.001		-0.001	
F	0.496		0.848	
ΔF	0.496		0.977	
ΔR^2			0.002	

*****p-value < 0.05

Discussion

In the recent years, different factors have added increasing concerns about quality in higher education, prompting the rise of measurements and improved mechanism like indicator of institutional performance, quality audit, accreditation, projects and evaluation, with endeavor to import models from the private organizations to the context of Higher Education Institutions (Ruler and Wong, 2010). It has been observed that teaching process has influence on student's perception and service quality, Hill (1995) identified negative results with regard of academic service factors including course content and teaching methodology. At present, higher education institutions have begun virtual learning system to minimize the learning gap and learning actions (Chin et al., 2020).Drawing upon the "Innovation Diffusion Theory" the current study aims to indentify the moderating role of motivation to learn among students satisfaction interactivity of e service quality and their collegiate efficacy at higher education. . Pinugu (2013) reported according to statistical analysis that no interaction impact was reported among self efficacy and academic stress becomes very weak moderating impact on academic satisfaction among students.

Accordingly, KMO index for website interactivity (0.828 > 0.5), students' motivation to learn, their collegiate stress and academic efficacy (0.761, 0.733 and 0.738) were found. On the other hand, reliability of student's motivation to learn has observed 0.824, collegiate stress of students was 0. 811, student's satisfaction efficiency was reported 0. 767 reported. All over the findings, there is non-significant association with motivation to learn ($p = 0.396$), Collegiate stress ($p = 0.066$) and academic efficacy ($p = 0.482$). Student satisfaction can be measured with performance of trainers, service delivery and support facilities (Mestrovic, 2017). Meanwhile, student satisfaction depends on the level of empathy among students by referring the Son et al. (2018) concealed that empathy has positive relationship with student satisfaction on education service. On the other hand, motivation to learn had a highly non-significant relationship with academic efficacy of the students ($p = 0.338$). Lastly, academic efficacy of the students was also non-significant in relationship with collegiate stress of the students ($p = 0.211$). The study by Sibai et al. (2021) have indicated that higher the year, lower the overall satisfaction among students on the service provided at higher institutions. The following results from the literature prove that assurance (Hamza, 2009) is key indicator of student satisfaction.

It is apparent that new innovation in technology-based learning look for accurate, dependable and reliable online services. In this manner, reliability has influential and imperative impact on perceived quality (Stodnick and Rogers, 2008). In fact, students are looking for client centric services from resource persons and aim to seek personalized consideration for each individual. Therefore the finding reveled that empathy and assurance

have strong affiliation (Udo, Bagchi and Kirs, 2011). Moreover, students are supposed to face various tasks like not challenging their academic abilities including attending class, writing essays and reports and problem solving but also face social and passionate capabilities like interaction with peers effectively, reaching out the mentor as well as personal potentials (Pinugu, 2013).

Furthermore, hierarchical moderating regression analysis was applied to extract the statistical findings based on two basic and two interactive models in this current study. The following results showed that website interactivity had an non-significant effect on the academic efficacy of students ($\beta = 0.076$, p-value = $0.482 > 0.05$).Similarly, the moderated effect of website interactivity on academic efficacy was also found to be non-significant ($\beta = 0.080$, p-value = $0.457 > 0.05$), Proceeding with the 'Interaction Model' based on the interaction relationship between the predictor variable (x) and moderating variable (z) such that restrictive relationship between website interactivity and academic efficacy was moderated by motivation to learn. Similarly, the findings proved significant relationship between self-efficacy, academic stress and student satisfaction among college students with academic stress has positively moderate relationship between self-efficacy and academic satisfaction (Pinugu, 2013).

However, the presence of stress among students has greater impact on perceived association between self-efficacy and academic satisfaction (Rayle, Arredondo & Kurpius, 2005). Although, Self-efficacy also seems to positively correlate with the personal academic adjustments (Thijys & Verkuyten, 2008), health and stress (Chemers et al., 1991). This point may demand valuable role of academic staff and instructors in enhancing efficacy and satisfaction among school students (Colombo, 2010). Aside from motivation to learn WI_x_MTL also showed non-significant effect on the academic efficacy of the student ($\beta = -0.139$, p-value = $0.165 > 0.05$) displaying evidence on the absence of any consequential and significantly conditional role of the moderator i.e. motivation to learn in relationship between website interactivity and students' academic efficacy.

In addressing these concerns, website interactivity had non-significant effect on the collegiate stress of students ($\beta = 0.095$, p-value = $0.066 > 0.05$). Similarly, the moderated effect of website interactivity on collegiate stress was also found to be non-significant ($\beta = -0.146$, p-value = $0.101 > 0.05$), Proceeding with the 'Interaction Model' based on the interaction such that restrictive relationship between website interactivity and collegiate stress was moderated by motivation to learn. Contrarily, motivation to learn (WI_x_MTL) exposed a straight significant effect on the collegiate stress of the student having ($\beta = 0.410$, p-value = $0.000 < 0.05$) displaying evidence on the presence of a consequential and significantly positive conditional role of the moderator i.e. motivation to learn with website interactivity and students' collegiate stress. Therefore, Students are actively

moreengaged in dynamic activity rather than passive learning environment. In light of this fact, they take part in exceptionally interactive world, they supposed to be same in their classes (Dziuban et al., 2003). The stress has negatively correlated with self-efficacy that means high level of efficacy are related with lower level of stress. In this term, negative association was observed (Huan, Yeo, Ang & Chong, 2006). Similarly, stress has not found with self-efficacy and might be contributed to the usage of copy strategies that permitted students to effectively tackle academic tasks which prompted higher level of self-efficacy (Dwyer and Cummings, 2006).

Conclusion

Based on the above results, website interactivity had non-significant association with motivation to learn, collegiate stress and academic efficacy among university students. On the other hand, motivation to learn held a significant relationship with collegiate stress of the students. Furthermore, motivation to learn had highly non-significant correlation with academic efficacy of the students. Lastly, academic efficacy of the students had also non-significant relationship with collegiate stress of the students. Hierarchical moderation regression analysis showed that website interactivity had non-significant effect on the collegiate stress of students). Similarly, the moderated effect of website interactivity on collegiate stress was also found to be non-significant. Contrarily, motivation to learn showed a significant effect on the collegiate stress of the student displaying an evidence on the presence of a consequential and significantly positive conditional role of the moderator i.e. motivation to learn with website interactivity and students' collegiate stress. It is concluded that besides the existence of student's high level interactivity on websites in the universities of Punjab district, accompanied by their greater motivation and drive to learn, their collegiate stress was increased significantly. Moreover, website interactivity on academic efficacy was also found to be non-significant. Conclusively, the existence of student's high level interactivity on websites in the universities of Punjab district, accompanied by their greater motivation and drive to learn, their academic efficacy remains unchanged.

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Citation of this Article:

Munir, F. (2021). Interactivity of E-Service Quality, Students' Collegiate Stress and Academic Efficacy: The Moderating Role of Motivation to Learn . *Pakistan Journal of Educational Research and Evaluation, 9*(2), 86-104.