

COVID-19, Impact of External Environment in the Formation of Students' Satisfaction as Well as Subjective Well-Being in the Context of E-learning

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Abstract

This paper intends to explore the role of external influences (i.e. E-environment and Technology-Internet-Quality) associated with satisfaction of the customer, leading to customers' subjective well-being. The study explores the fundamental role of the environmental and technological perspectives in the generation of consumer's response behaviors through the cognitive process in the context of e-learning. Using a convenience sampling technique, data was accumulated from three universities having e-learning as their mode of delivery of education. 1,338 students of e-learning responded to the survey questionnaire. The results corroborate the assertion laid in the hypothesis that e-environment, psychological and technological influences of the students (customers) play a significant role in the development of customer satisfaction which leads to the subjective well-being. The findings of the study contribute in building a rigor of social cognitive theory in the context of e-learning. Consumer's cognitive process postulate that customer's e-environment and technological factors significantly impact the psychological characteristics which ultimately affects response behaviors of customers. The concurrent impact of customer satisfaction and subjective well-being in the divergent fields of technology, consumer behavior and individual psychology have remained unexplored. This foray would therefore help in understanding the complex relationship, especially when viewed in the backdrop of students' dissatisfaction with the e-learning mode of education in the obtaining environment of COVID-19. Besides filling the existing void in the literature, this study will thus help the policy makers, academicians and practitioners to address these intricate issues affecting student's satisfaction so as to smoothly roll out the e-learning mode of education.

Keywords: COVID-19, E-learning, E-environment, Technology-Internet-Quality, Subjective well-being.

JEL Classification: Z000

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1. Introduction

While the health workers throughout the world continue to control the uncontrolled and devastating effects of COVID-19, its effects have been felt in all walks of life (Cathy Li & Lalani Farah, 2020). Resultantly, the world is no longer the same old world, neither would it be even in the post Corona environment. The world has to come to terms with the “New Normal” in every walk of life. Like all other fields education sector has been one of the most affected sectors having direct impact not only on the knowledge economy but also impinged upon other avenues (Arora & Srinivasan, 2020). While e-Learning had assumed due significance in pre-COVID-19 days, it became the only available instrument to dispense education in the ongoing lock down phenomena, wherein the entire Spring-2020 semester throughout the world has been conducted through the unorthodox, e-Learning mode of education (Markets, 2020). This innovative and disruptive mode of education came to the rescue of educationist throughout the world (Arora & Srinivasan, 2020). It is also a fact that in COVID-19 environment, the bulk of the students have expressed their frustration over the mode of delivery through e-Learning, majority expressing their dissatisfaction with the quality of internet in remote areas and teachers’ lack of preparedness for the delivery of contents through this mode of education (Ichsan et al., 2020). With e-Learning becoming the main stay of education system, the need for identifying the factors impacting the students’ satisfaction and resultant well-being from the e-Learning is felt more than ever.

The educational landscape and its support process of higher education has witnessed numerous changes owing to the introduction of a variety of technology enabled e-Learning tools. However, the real impact of e-Learning on the education sector came to the fore during the ongoing lock down due to COVID-19, wherein, it remained the sole tool through which education is being dispensed globally. Previous research posits of having no significant difference in the outcome of learning between conventional brick and mortar learning methods vis-à-vis e-learning mode of education delivery (Biner et al., 1997; Allen et al., 2002). Studies carried out on the subject revealed e-learning to be a feasible mode of delivery of education with an additional advantage over conventional learning modes. The span of advantages of e-learning over conventional learning modes included the flexibility of space and time. Moreover, convenience of asynchronous participation, self-paced and learner centered, universal availability, permanent logging of the learning activities, besides a host of analysis tools (Bowers & Kumar, 2015; Zhang et al., 2004).

Though, a lot of resentment surfaced against e-Learning as the sole mode of education, but it has also been acknowledged that students would have suffered immensely in terms of time and engagement. It is presumed that having found its place in the educational industry, e-Learning cannot be wished away even in post-COVID environment. There is, therefore,

a need to assess the students' satisfaction from e-Learning to formulate policies and strategies that would lead to greater satisfaction of students leading to their well-being.

The review of prior literature on student satisfaction and student wellbeing in the context of e learning suggests several open research gaps specifically in COVID 19 environment. Though significant amount of research advanced our understanding towards success factors of e-learning such as information quality (Cidral et al., 2018), service quality (Pham et al., 2019), self-efficacy and learner-content (Alqurashi, 2019), student satisfaction (Hamidi & Jahanshaheefard, 2019) and students well-being (Shah, 2016). However practitioners still face challenges in developing e-learning model successfully (Al-Fraihat, Joy, & Sinclair, 2020). Research observers call for further research to examine the key drivers of student satisfaction and subjective wellbeing in the context of e-learning (Alqurashi, 2019; Puška et al., 2020; Vate-U-Lan, 2020), specifically in context of developing countries (Pham et al., 2019) such as Pakistan. The current study aims to explore the existing gap in literature by examining the drivers of student satisfaction and subjective wellbeing in the context of e-learning. This study utilizes social cognitive theory as a theoretical lens to model the e-learning environment, technology quality, student satisfaction, and student subjective wellbeing.

2. Literature Review

2.1 Theoretical Framework

Determining the level of students' satisfaction should be considered as an essential aspect for determining the needs of the students and resultant designing their services accordingly (Ryan & Poole, 2019). The popularity and wider currency of e-Learning having an inherent advantage of empowering students to choose from a wide variety of menu without being chained to the physical, financial and geographic limitations was the main reason for the wider acceptability of this innovative mode of learning, however, in the lockdown days, it has become a necessity rather than a choice (Händel et al., 2020; Martin & Betrus, 2019).

Social cognitive theory is a widely used theoretical approach in education, psychology and communication (Bandura, 1999). Social cognitive theory provided a framework of psychosocial mechanisms of knowledge acquisition through experiences, social interactions and outside media influences (Bandura, 1999). Social cognitive theory is used to explain multiple consumer behaviors such as green consumer behavior (Lin & Hsu, 2015), sustainable consumption behavior (Phipps et al., 2013), digital piracy (Lowry, Zhang, & Wu, 2017), behavioral economics (Reisch & Zhao, 2017), adoption of internet banking (Boateng et al., 2016) and consumer satisfaction and well-being (Bandura, 2011; Tang, Guo, & Gopinath, 2016).

Social cognitive theory advocates that an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and outside media influences (Lim et al., 2020; Schunk, 2012). Applied on the context of e-learning it can be postulated that e-environment and technology quality significantly drive student satisfaction that ultimately turn into subjective wellbeing.

2.2 Research Hypotheses

2.2.1 *e-Learning Environment, Student Satisfaction and Subjective Well being*

Out of the numerous definitions offered by many scholars, few definitions are appended; e-learning is to use the potential of information and communication technologies (ICTs) to support and facilitate the education process (Mousa et al., 2020). The multimedia technologies used over the internet have completely revamped knowledge delivery. This changed paradigm has catalyzed e-learning to become an alternative to the conventional class room education offered in physical environment (Zhang et al., 2004). Pre-Corona, e-Learning had scaled up exponentially throughout the world. Whereas, in conventional class room environment, instructor control the pace of learning as well as the content to be delivered, e-learning offers flexible learning environment which is characterized by learner centered, self-paced and having the liberty of time and space constrictions (Fallah & Ubell, 2000; Hiltz & Turoff, 2002; Morales, Cory, & Bozell, 2001; Piccoli, Ahmad, & Ives, 2001; Zhang et al., 2012). Learning environment is described as the "The setting in which learning takes place; may be in physical-classroom or virtual-web based environment" (Piccoli, Ahmad, & Ives, 2001). e-Learning environment is also denoted as a Virtual Learning Environment (VLE), Course Management System (CMS), Knowledge Management System (KMS) as well as Learning Management System (LMS), (Moore, Dickson, & Galyen, 2011). The digital aspects of courses in the web based learning mode are denoted by Virtual learning environment is the platform.

Technology-Mediated Virtual Learning Environment" (TVLE) is prescribed as "computer-based environments which are relatively open systems, that permits interacting and sharing of knowledge amongst participants and instructors' and which provide access to a wide array of resources" (Chou & Liu, 2005). The lack of Learner-Instructor contact has been compensated through various measures including; interactive e-classroom, non-linear interactive digital videos, virtual mentoring, and learning by asking (Shah, 2016). Based on "Constructivist Learning Theory" (Qiu, 2019) and "Cognitive Information Processing Theory" (Eom, 2019), the principles that drive these concepts are multi-media integration, interactivity, self-directivity, just in time knowledge acquisition, and last but not the least is the flexibility (Zhang et al., 2004). The inadequately prepared or less than prepared e-learn

ing system on the other hand, having insufficient learner-content interactively and lack of flexibility tend to create more confusion, reduced learner interest and lead to frustration rather than facilitating the learning environment (Shah, 2016). e-environment was found as a significant contributing factor in developing satisfaction (Shah, 2016; Shrestha et al., 2019) and wellbeing (Misopoulos, Argyropoulou, & Tzavara, 2018). Based on the review of the literature and framework, the hypotheses formulated from E-Learning Environment (EENV) are as under: -

Hypothesis 1: E-environment has a significant and positive impact on customer satisfaction.

Hypothesis 2: E-environment has a significant and positive impact on student subjective well-being.

2.2.2 Technology-internet quality, Student Satisfaction and Subjective Well being

Whereas, technology has always impacted the learning process, its impact could not be felt more significantly, when the entire education process from toddlers till PhD level of education had to be imparted through the technology assisted e-Learning platforms (Arora & Srinivasan, 2020). But for the e-Learning, the entire architecture of education system would have crumbled in the lock down days. Technology having now been embedded in the learning systems, it will continue to be the main edifice of education in the days to come, thereby completely reshaping the landscape of education (Price et al., 2017; Shah & Attiq, 2016). The concept of 'Technology Enhanced Learning is corollary to the customization of technology in the learning field' (Healey, 2018). Technology Enhanced Learning encompasses learners and technology provided socio and technological innovations which support educational practices in diverse settings (Persico & Steffens, 2017).

Technology quality has been explained as the "learners' perceived quality of Information (Al-Fraihat, Joy, & Sinclair, 2020). Having computer as its base and heavily dependent on technology, the success of e-Learning thus becomes completely dependent on the quality of technology (Freeze et al., 2010). The effectiveness and success of learning depends on the reliability and quality of technology as well as access to Hardware and Software (Zhou et al., 2019). Research has drawn evidence that technology applications and e-learning have over a period of time become synonymous and complementary to each other, the use of technology having positive effects on the effectiveness of e-learning (Yacob et al., 2012). It has also been ascertained that the enhancement of knowledge and increased attention in searching knowledge is co-related to the use of new technology (Yacob et al., 2012). A reliable and high quality of technology thus the edifice for the effectiveness of e-learning, a fact amply corroborated in the lock down days (Markets, 2020; Urs, 2013).

Internet quality is denoted as “learners’ perceived quality of network including network transmission speed” (Sun et al., 2008). The role of internet in e-learning is pivotal as it has transited from programmed education and learning machines towards internet based learning which is now being used as a medium of communication between human subjects of education (Simuth & Sarmany, 2014). The frustration caused and dissatisfaction expressed towards e-learning in the third world countries in general and Pakistan in particular in the ongoing lock down due to the pandemic is primarily due to the oscillating quality of internet, particularly in remote areas of the Country (Saeed, 2020). The ongoing lock down has amply proved that the flexibility provided by the online education allows students to determine their own pace, and makes them responsible for their own learning through the enhanced student centeredness (Cathy & Lalani, 2020). The forced adoption of online learning mode of education has been made possible due to the tremendous rise in the ICT and has impelled all educational institutions to develop new online delivery methods (Hogan, 2019; Shah & Attiq, 2016). Empirically, it has been corroborated that e-learners’ satisfaction is affected by the technology dimension, consisting of technology quality and Internet quality (Toufaily, Zalan, & Lee, 2018).

As seen in the ongoing online education dispensation, the effects of technology learning environment through technology enhanced learning and the adoption of technology depends to a great extent whether it is user friendly and what the quality of technology is. This will lead to greater user satisfaction or otherwise and establish a positive correlation between quality/reliability in IT and learning effects (Cathy & Lalani, 2020; Wambua, 2017). Positive co-relationship has been determined between the impact of digitization on academic achievement, critical thinking and learning motivation (Chou, Wu, & Tsai, 2019). The existence of quantifiable relationship between subjective well-being and the use of technology has been proved when technology is used for learning purpose (Cudd & de Witte, 2017). Based on the review of the literature and framework, the hypotheses formulated from Technology and Internet Qualities are as under:-

Hypothesis 3: T-I-Quality has positive impact on student satisfaction.

Hypothesis 4: T-I-Quality has positive impact on student subjective wellbeing.

2.2.3 E-Learning, student satisfaction and subjective wellbeing

Satisfaction can be denoted as an individual’s feelings of pleasure or disappointment, which results from the comparison of the perceived performance of the products in relation to expectations (Kotler & Keller, 2006). Learners Satisfaction on the other hand is described as the “perceptions of the extent to which their learning experiences were helpful and enjoyable” (Kuo et al., 2014). Student satisfaction being an enjoyable and a successful

phenomenon, learner's satisfaction is derived in a conventional learning environment that blends online elements. Having direct impact on the adaptability of a system, student satisfaction could be identified as the positive feelings or students' attitude towards their learning activities (Chen, Hsiao, & Lee, 2005).

Subjective well-being (SWB) is used interchangeably with 'happiness' and life satisfaction (Diener, 2009; Diener, Oishi, & Tay, 2018) and is described as satisfaction or happiness with life as a whole or life in general (Andrews & Robinson, 1991). SWB reflects an overall evaluation of the quality of a person's life from her or his own perspective (Diener, Lucas, & Oishi, 2018). Being a vastly explored subject, SWB is considered as an important phenomenon by virtue of psychological SWB consists variables like satisfaction with life, work satisfaction, and that of marriage. The other variables could be feelings of fulfilment and meaning, frequent experiences of pleasant emotions, and the infrequent experience of unpleasant emotions (Scollon et al., 2004). In simple words, SWB is a phenomenon in which life is evaluated in quotient of satisfaction and a balance between positive and negative effects. Other than these effects, it encapsulate life satisfaction and happiness (Chau et al., 2018).

Studies have found that satisfaction of fundamental needs is reported to be resulting in SWB or happiness (Deci & Ryan, 2002). Studies have shown that there exists a positive relationship between SWB and life satisfaction, therefore, individuals possessed with high levels of subjective well-being experience higher life satisfaction and a higher levels of happiness (Diener & Seligman, 2002; Suldo & Huebner, 2006). To ascertain the effects of variant orientation differed in terms of SWB, a study proved the existence of differences in SWB between students having goals related to self-improvements and students having avoidance tendencies. A need was therefor felt to include the measures of SWB when evaluating the role of goal orientation in learning (Tuominen, Salmela, & Niemivirta, 2008). Based on the above discussion, there is a need to establish a hypotheses here. The hypotheses formulated is:

Hypothesis 5: Student satisfaction has positive impact on student subjective wellbeing

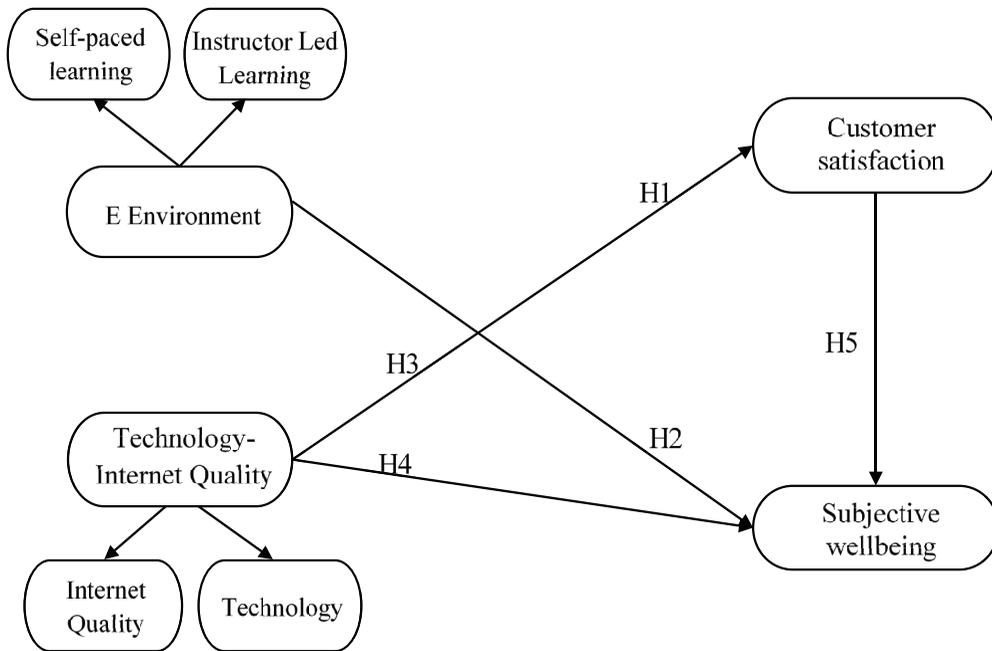


Figure 1: Conceptual Framework

3. Research Methodology

This study has resorted to a quantitative research approach for wider comprehension and generalizability of results. The full-scaled online survey was conducted among students of universities who were offering exclusively education on e-Learning mode of education. Convenience sampling strategy with the criteria that each participant should be enrolled in university providing e-learning education. Data is collected form the students of different universities offering e-learning such as such Virtual University of Pakistan VU, Virtual Campus of COMSAT (VCOMSAT) and Allama Iqbal Open University. The respondents were requested through email to respond to an online-administrated questionnaire voluntarily. This approach is helpful to collect the responses from genuinely interested respondents and avoid non-serious respondents. A total of 2000 questionnaire were distributed out of which only 1338 valid responses were included for data analysis, which represents a response rate of 66.9%.

The sample of 1338 students included 838 males and 500 females with 7% of respondents bearing age less than 20 years, the ages of 32 % respondents varied between 21-25, whereas the ages of 32 % varied between 26-30 years. 17% of the respondents aged between 30-35 years, whereas, 7 % aged between 35-40 years and 5 % were 40 and above. As far as distribution of the students between the three universities were concerned, 21 % of respondents were from AIOU, 65 % of the respondents were from VUP, and 15 % were from VCOMSAT. The distribution of students between home based and campus based, out of the total, 52% students pursued their e-learning education from campus-based learning mode, 33 % were home based and 15% had adopted other modes of education for pursuing e-learning education.

3.1 Measures

The questionnaire created online through Google doc was forwarded to the Universities. Responses were recorded online, hosted directly through researcher designated email. The questionnaire consisted of 26 items with four main research variables. E-environment is operationalized as self-paced learning and instructor led learning environment. Self-paced learning is measured by using 6 items scales adopted from (Choudhury & Pattnaik, 2020; Liaw, Huang, & Chen, 2007) Instructor led learning environment is measured on 3 items scale adopted from (Choudhury & Pattnaik, 2020; Liaw, Huang, & Chen, 2007). Technology-Internet Quality is operationalized as technology quality and internet quality. Technology quality is measured by using 4 item scale adopted from (Amoroso & Cheney, 1991; Wedlock & Trahan, 2019) and internet quality is measured by using 4 item scale adopted from (Amoroso & Cheney, 1991; Sun et al., 2008; Wedlock & Trahan, 2019). Customer that is students' satisfaction measurement sales is consisting of 4 items adopted form (Wang, Lew, & Lau, 2020; Wang, 2003). Subjective wellbeing measurement scale is consisting of 5 items adopted from (Diener et al., 1985; Margolis et al., 2019) . Five point Likert scale was used to record the responses (5=Strongly Agree to 1=Strongly Disagree).

4. Results

Data has been analyzed through SPSS-25 and AMOS-25. A series of analysis tools were applied to establish the validity and reliability of data and testing of proposed relation paths. Data was initially tested for missing values, outliers, and normality. All the items fell within the expected range of ± 3 Skewness and Kurtosis which indicates the normality of the data. Common method biases were eliminated by using Harman's single-factor (Chang, Van Witteloostuijn, & Eden, 2020; Gorrell et al., 2011). The results of factor analysis using maximum likelihood method showed that largest factor accounted for 37.048% (see Table 1) less than the threshold value of 50%, an indication of no common method biases (Habib &

Qayyum, 2017, 2018; Podsakoff et al., 2003). Variance Inflation Factor (VIF) was estimated to access the issue of Multicollinearity. Results showed that VIF ranged between 1.65 to 3.23 (see Table 2) which is less than the threshold value of 4 (Habib & Qayyum, 2018; O'Brien, 2007), indicating that there is no issue of multi-collinearity.

Table 1
Common Method Biases

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.632	37.048	37.048	4.457	17.143	17.143
2	2.779	10.690	47.737	6.300	24.230	41.373
3	1.563	6.013	53.750	1.542	5.930	47.303
4	.					
5	.					
6	.					
26	.158	.609	100.000			

Table 2
Variance Inflation Factor for Latent Variables

Model	Collinearity Statistics	
	Tolerance	VIF
1. SPLE	0.31	3.23
2. ILLE	0.45	2.25
3. TEQU	0.39	2.55
4. INQU	0.61	1.65

4.1 *Measurement Model*

Covariance based Structural Equation Modeling (SEM) was used to analyze the data. In first phase, measurement model is estimated to establish the validity and reliability of the measures. In second phase, structural model was assessed for the testing of structural path. Measurement model was consisted of 26 observed variables. E-Environment and T-I-Quality were estimated as second order latent variables. Results of factor loads, average variance extracted, composite reliability and Cronbach Alpha are presented in Table 3. The goodness of fit indices for measurement model are acceptable as CMIN /df = 2.36, $p \leq 0.00$, GFI= .914, AGFI= .896, NFI= .913, CFI= .948, RMSEA = 0.053.

Results of measurement model showed that factor load for each item exceeded the threshold value of .50, average variance extracted (AVE) for each construct is greater than .50, composite reliability (CR) and Cornbach alpha for each construct is greater than .70(Hair Jr. et al., 2017). The results are in favor of convergent validity (AVE>.50) and reliability (CR>.70, $\alpha > .70$) (Habib & Qayyum, 2018; O'Leary & Vokurka, 1998) For the assessment of discrimination validity the Fornell and Larcker (1981) criterion is used. The results are in support of the establishment of discriminant validity (see Table 4) as square root of AVE of each latent variable is higher than their respective correlation values (Hair Jr, Babin, et al., 2017).

Table 3
Confirmatory Factor Analysis

Construct	Abbreviation	Measurement	Estimate	CR	AVE	Alpha
		Items				
Self-Paced Learning	SPLE	SPLE1	.885	0.618	0.906	0.894
		SPLE2	.861			
		SPLE3	.650			
		SPLE4	.825			
		SPLE5	.670			
		SPLE6	.796			
Instructor Led Learning	ILLE	ILLE1	.780	0.634	0.839	0.827
		ILLE2	.812			
		ILLE3	.797			
Technology Quality	TEQU	TEQU1	.786	0.595	0.855	0.815
		TEQU2	.768			
		TEQU3	.732			
		TEQU4	.799			
Internet Quality	INQU	INQU1	.648	0.500	0.799	0.734
		INQU2	.798			
		INQU3	.641			
		INQU4	.731			
Customer Satisfaction	CSAT	CSAT1	.735	0.552	.0830	0.787
		CSAT2	.655			
		CSAT3	.787			
		CSAT4	.786			
Customer Subjective Well-Being	CSWB	CSWB1	.777	.577	.872	.874
		CSWB2	.750			
		CSWB3	.718			
		CSWB4	.788			
		CSWB5	.762			

Note: CMIN /df = 2.36, $p \leq 0.00$, GFI = .914, AGFI = .896, NFI = .913, CFI = .948, RMSEA = 0.053

Table 4
Fornell-Larcker Discriminant Validity and Correlation Analysis

Constructs	Mean	SD	AVE	SQRT AVE	1	2	3	4	5	6
1.SPEL	3.76	.66	.618	0.79	0.79					
2.ILLE	3.82	.71	.634	0.80	.71**	0.80				
3.TEQU	3.87	.72	.595	0.77	.65**	.58**	0.77			
4.INQU	3.57	.73	.500	0.71	.53**	.42**	.58**	0.71		
5.CSAT	3.85	.73	.522	0.72	.63**	.66**	.61**	.45**	0.72	
6.CSWB	3.84	.62	.577	0.76	.67**	.66**	.58**	.45**	.69**	0.76

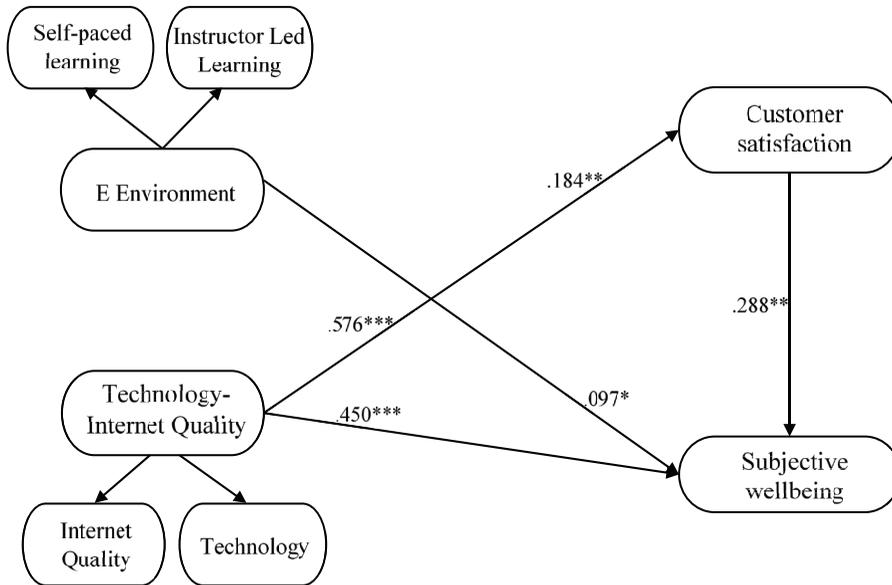
4.2 Hypotheses Testing

Satisfactory results for measurement model are an indication to proceed towards structural model for hypotheses testing. Structural path analysis is performed to test the proposed relational path. The results of hypotheses testing are presented in Table 5 and Figure 2. The results of path coefficients indicated that EENV has a significant impact on CSAT ($\beta=0.184, p<0.01$), supporting **H1**. The results of path coefficients indicated that EENV has a significant impact on CSWB ($\beta=0.097, p<0.05$), supporting **H2**. The results of path coefficients indicated that TIQ has a significant impact on CSAT ($\beta=0.576, p<0.001$), supporting **H3**. The results of path coefficients indicated that TIQ has a significant impact on CSWB ($\beta=0.450, p<0.001$), supporting **H4**. The results of path coefficients indicated that CSAT has a significant impact on CSWB ($\beta=0.288, p<0.01$), supporting **H5**.

Table 5
Hypotheses Result and Structural Relationship

Hypothesis	Structural Relationship	B	P	Hypotheses result
H1	EENV→CSAT	.184	< 0.01	Accepted
H2	EENV→ CSWB	.097	< 0.05	Accepted
H3	TIQ→CSAT	.576	< 0.001	Accepted
H4	TIQ→ CSWB	.450	< 0.001	Accepted
H5	CSAT→CSWB	.288	< 0.01	Accepted

Note: $CMIN/df = 2.13, p \leq 0.00, GFI = .918, AGFI = .892, NFI = .919, CFI = .953, RMSEA = 0.050$



Note: $***p < 0.001$, $**p < 0.01$, $*p < 0.05$

Figure 2: Structural model

5. Conclusion

The basic purpose of the study was to evaluate the influence of environmental and technological factors in the development of customer (students’) satisfaction (e-learner satisfaction), leading to SWB in an e-learning environment. The purpose set forth for the study has been achieved by empirically testing a comprehensive theoretical framework of e-learner’s satisfaction and subjective wellbeing based on social cognitive theory. The peculiarity that makes this research unique is the study of e-learner satisfaction and subjective wellbeing towards e learning in the pandemic situation of COVID 19. E-Learning has achieved global currency in the student cohorts very rapidly. The widespread acceptance and enthusiastic response to e-Learning has meteoric boost to e-Learning industry both from education as well as commercial point of view with the expected revenue from e-Learning industry reaching \$ 325 billion by 2025. The extent of e-Learning penetration in the corporate world can be gauged from the fact that 77% of the US Companies had used Online Learning in 2017.

However, in the obtaining environment of COVID-19, it has become the only media through which education is being dispensed globally. The findings of the study are in sync with the proposition of S-O-R model and TAM. In line with the propositions of S-O-R model it was found that E-Environment significantly contributes in developing e learners’

satisfaction (Shah, 2016) and subjective wellbeing (Shah, 2016; Sheldon & Bettencourt, 2002), it supports **H1** and **H2**. The study findings suggest that E-environment offers a more flexible learning style as compared to traditional learning (Pham et al., 2019). E-learning with flexibility of time, space and connectivity equip students with the ability to control the pace and rhythm of their studies without attending classrooms physically (Bhuasiri et al., 2012). Well-designed e-learning system enhances the satisfaction and well-being of students through interactivity, self-directivity and just in time knowledge acquisition (Eom, 2019; Qiu, 2019). The results revealed a positive association between Technology-Internet quality, student satisfaction and subjective well-being. Thus it supports **H3** and **H4**.

Technology dimensions such as quality of technology and internet significantly influence the smooth dispensation of education through E-environment (Hogan, 2019; Shah & Attiq, 2016). A reliable and high quality of technology and intent allow students to continue their education at their own conveniences, thus resulted into favorable evaluations of e learning system that are student satisfaction and student well-being (Toufaily, Zalan, & Lee 2018). The study findings supported a positive association between customer satisfaction and subjective well-being, in support of **H5**. Consistent with TAM, it was found that technology factors have a significant impact on e learners' satisfaction (Revythi & Tselios, 2019) and subjective wellbeing (Shah, 2016). The study findings revealed that customer satisfaction develop a balance between positive and negative emotions which encapsulate life satisfaction and happiness (Chau et al., 2018). Thus increased satisfaction is associated with subjective well-being.

5.1 Theoretical Significance

The approach adopted in this study differ from conventional approach wherein the outcome of e-learning is conceptualized qualitatively as a result of technology or system feedback(s). Till now, limited no of studies have been carried out on theoretical examination and empirical testing of the antecedents and outcome of e-Learner's satisfaction. This study has endeavored to build and test social cognitive theory to explore the effects of technological, environmental, and psychological factors on the behavior formation of e-learning outcomes in customers' context, leading to their SWB with the focus on students undergoing education in universities in Pakistan which are offering e-learning as mode of education. With this in the backdrop, this study provide an empirically valid conceptual framework to fully comprehend the cognitive process of customers'/students' satisfaction in the context of e-learning in pandemic situation of COVID 19. Exploring the various knowledge domains including educational psychology, customer psychology, individual's psychology, and consumer cognitive behavior models this research opens new avenues of inquiry.

The results of the empirical study have shown all the hypotheses having good explanatory power, thereby elucidating that integration of technological, environmental, and psychological factors with a theoretical basis explain the e-learning phenomenon in greater details. Dilating on the significant role of motivational needs of students studying through e-learning education in influencing their workplace behavior, university management and especially the Higher Education Commission of Pakistan may prudently benefit from the findings of the study. They may resort to structuring the e-learning environment which should encourage effective learning behaviors and dissuade unproductive factors in the students who have resorted to e-learning. The findings of this study provide an edifice to understand the process satisfaction and well-being from undertaking e-learning.

5.2 *Practical Implications*

The current study endeavors to offer key practical implications, particularly, for policy makers, organizations (universities), and e-learners (customers). In the COVID-19 environment, the results of this study will help increase universities/ organizations understanding about the underlying psychological processes of customers' satisfaction and their well-being along with in-depth comprehension of e-learner's psychological factors.

The outcomes of this research would also offer an insight to the higher education institutes to manage, restructure, and recalibrate their resources and learning environment, re-evaluate their funds allocation and time management. Moreover, this study will also help HEIs to reskill their teachers to enhance students' interest in acquiring education through this innovative mode of education. The results of this expose would entice conventional HEIs to recalibrate themselves for this type of innovative mode of education for increased students' satisfaction and higher revenues generations. By integrating e-learning in their workplace culture, corporates may also escalate their learning curves, save revenue and reap the benefits for optimum productivity.

5.3 *Limitations and Future Recommendations*

Although this research offers interesting findings and practical implications, some limitations should be taken into consideration. Since this study relied on collecting data from students who were enrolled in universities offering e-Learning as an exclusive mode of education delivery, careful interpretation of the results would be required while generalizing the results. There is a need to determine the impact of e-Learning on the students from different cohorts, especially students who got their first experience on attaining education through e-Learning from conventional universities.

The application of the results of this study on younger adults or school children might vary when viewed in the backdrop of the fact that the data for this study was collected from adults studying at university level. This research has incorporated various dimensions of technology dimension and learning environment independent variables, inclusion of other dimensions like usability, interactivity and simplicity may require further exploration. The conflict in corporate training settings between the developments of job skills in e-learning environment vis-à-vis propensity towards personal development in formal setting needs further exploration. Incisiveness of demographic factors like age and profession would be more to comprehend whether such difference could impact the satisfaction and subjective well-being of e-learners or not.

E-Learning has come to stay and stay forever, hence HEIs and other learning institutions may brace themselves for this innovative and disruptive mode of education. The phenomenon has gained wider acceptability in the obtaining environment in which educational institutions have had to remain shut for indefinite period of time. This mode of delivery of education was thus thrust upon the student's the world over. Adoption of wise policies which would lead to students' satisfaction and their well-being would result into reaping of optimum benefits from e-Learning mode of education.

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