

## **Pandemic Induced E-Learning and the Impact on the Stakeholders: Mediating Role of Satisfaction and Moderating Role of Choice**

*By Ganesh Dash\**

This study tries to assess the impact of e-learning on the stakeholders, especially teachers and students, and the differences. COVID-19, the current pandemic, is taken as the context. A structural equation modeling approach is undertaken, and PLS-SEM (partial least squares) (multi-group) method is chosen. Perceived Usefulness and Perceived Ease of Use are the independent constructs, with Behavioral Intention to Use being the dependent construct. Satisfaction is taken as a mediator, and Choice is used as a moderator. One hundred ninety-seven teachers and two hundred seventy-nine students comprise the sample. Results show that teachers' perceived usefulness has a significant and positive impact on their satisfaction. For both teachers and students, perceived ease of use has a significant and positive impact on behavioral intention. Satisfaction is a successful mediator for teachers but not for the students. Choice has proved to be a good moderator for the relationship between perceived ease of use and behavioral intention to use. The study is unique as a new moderator (choice) is introduced to the modified model, and in-depth analysis is conducted to assess the relationships and the differences between the two groups. Further, it is a multi-national study enhancing its universal implications.

*Keywords:* e-learning, pandemic, SEM, PLS, teachers, students, satisfaction, choice

### **Introduction**

In today's knowledge economy environment, e-learning embodies an unconventional means of teaching and learning, and numerous organizations utilize these learning methods to develop the employees and students (Sawang, Newton, & Jamieson, 2013). E-learning can be defined as "the delivery of training and education via networked interactivity and a range of other knowledge collection and distribution technologies." It has also been described as a distance education that uses internet-based technology (ICT) and a learning management system (LMS) (Derouin, Fritzsche, & Salas, 2005). In today's technological environment, e-learning platforms are becoming critically important. Due to this sudden technological advancement in the education sector, various e-learning platforms are readily available to students. E-learning is also famous as web-based learning and is provided convenient and timesaving with the internet's help.

Furthermore, the e-learning methodology offers flexibility to students and learners to use it anytime and anywhere. Therefore, e-learning systems have become an important tool to impart a flexible mode of education to college

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students. Likewise, an online learning system is defined as an information system through which various learning aids like audio, video, and text can be assimilated through electronic mails, interactive sessions, conferences, assignments, and quizzes (Lee, Hsieh, & Ma, 2011). Therefore, this research is conducted to understand the young mind's views on e-learning and develop and validate a model utilized in adopting e-learning practices. The model would be beneficial and applicable to the e-learning systems of various universities and colleges. To understand the adoption process of e-learning Platforms, researchers have used different adoption theories.

This study builds upon the Technology Acceptance Model (TAM) (Davis, 1989) and extends the same with all the constructs validated in the context of E-learning technology. There are two major stakeholders in e-learning: teachers and students. In this study, the author has tried to find the significant differences in their perceptions of usefulness, ease of use with their satisfaction levels, and the resultant behavioral intention to use. Whether satisfaction mediates the proposed relationship in the same manner or differently for both is the focus. Further, a new moderator "choice" is added to verify the interaction effect is the same for both or not (Dash & Chakraborty, 2021a). Ultimately, the author has tried to compare these two groups' adoption of eLearning induced by the current pandemic. This study provides specific implications for the Governments, regulatory bodies, platform providers, and administrators to improve the existing system. Taking both the countries' progress in implementing the e-learning system and the resultant impact on the stakeholders, i.e., the teachers and the students, is the author's focus in this study.

The following section deals with a review of existing literature and consequent hypotheses development. It ended up with an integrated conceptual framework to be tested with empirical data. Section three discussed the methodology and section four discussed the results. Section five provided a general discussion with implications. The last two sections dealt with limitations, future directions, and the conclusion of the study.

## **Literature Review**

Numerous elements are involved in shaping the technology usage of the faculty members (Stockless, 2018) that can enhance or damage the adoption of the same. Attitude towards technology (Mehta, 2021; Teo, Luan, & Sing, 2008), perceived usage, or technology-need fit (Mehta, 2021; Aubusson, Schuck, & Burden, 2009; Uzunboylu & Ozdamli, 2011) is considered as the elements. Major studies with empirical evidence from across the globe have found that perceived usage and ease of use can affect the technology adoption by teachers (Mehta, 2021; Keong & Wah, 2017; Kalogiannakis & Papadakis, 2019). Numerous studies have been carried out on teachers' acceptance of technology (Scherer, Siddiq, & Tondeur, 2019); these studies appear to be focusing on two trends – incorporation of digital competencies in curricula and assessment (Beller, 2013; Siddiq et al.,

2016) and encouraging teachers to use technology in their teaching (Shute & Rahimi, 2017; Straub, 2009).

The achievement of any data framework relies upon using the clients' framework (Almaiah, 2018). As a result, in terms of the online learning framework, the understudy adoption of e-learning is one of the fundamental indicators for online learning framework achievement. A few studies in the previous literature have concentrated on concerns related to online learning selection in several countries worldwide. For example, Saad, Alias, & Ismail (2013) used TAM with the IDT model to scrutinize the fundamental factors that affect Malaysian college goers' use of an e-learning system. According to the results, relative points of interest, recognizability, trialability, saw similarity, intricacy, and saw pleasure are the factors that affect learners' judgment to use an online learning system in Malaysia.

UAE was used as a contextual analysis for a quantitative study by Salloum et al. (2019). The findings revealed that four variables (imaginativeness, efficiency, confidence, and knowledge sharing) were correlated with improved online learning system acceptance among learners. Brown and Charlier (2013) examined the factors that influence understudy adoption of e-learning based on TAM3. He discovered that fun-loving personality, self-adequacy, and uneasiness when using PCs, perception of outside influence, emotional expectations, and perceived importance were the most important factors of online learning approval. In any case, social effect, provability, and perceived enjoyment were not related to the acceptance of e-learning systems in Saudi Arabia. Almaiah, Jalil, and Man (2016) suggested a new structure based on the Delphi strategy for evaluating the achievement variables of online learning system use in Saudi Arabia. Results included 11 essential components grouped into four spaces that promoted site efficiency, innovation choices, top administration support and e-learning knowledge among faculty and students.

At one of the universities in Saudi Arabia, Mukred et al. (2019) used the UTAUT model to examine the variables affecting understudies' use of e-learning frameworks. They discovered that expectations about execution and exertion affected e-learning acceptance. Chang, Hajiyevev, and Su (2017) found that emotional expectations, experience, and happiness influenced e-learning acceptance in Azerbaijan. TAM was also used to analyze factors affecting e-learning identification. Self-adequacy, emotional standards, happiness, nervousness, and involvement in using computers significantly affected understudies' acceptance of e-learning (Soyşen, 2016; Abdullah & Ward, 2016). In general, researchers discovered that scholarly staff information on learning innovations, understudy information on PC systems, and specialized foundations were essential factors in promoting successful e-learning recognition in Saudi Arabian colleges (Alhabeeb & Rowley, 2017; Sabr & Neamah, 2017).

The critical challenges in selecting an e-learning platform in developing countries were a lack of ICT knowledge, a helpless system base, and a lack of substance improvement (Hasan & Bao, 2020). Another study discovered that system attributes, web comprehension, and PC self-viability are the key issues that impede the effective implementation of an e-learning framework in the classroom

(Vershitskaya et al., 2020). Three critical challenges of e-learning, according to a comparative study conducted in Kenya, are a flawed ICT system, a lack of professional skills, and budgetary constraints (Vershitskaya et al., 2020). According to Schaffer (2004), inadequate interface design, insufficient specialized assistance, and a lack of IT skills are the main roadblocks to successful usability.

Various e-learning apps are available in the market and at the college and university levels. India has the “SWAYAM” platform, which is offering many courses for free. Due to the pandemic like the Coronavirus, these apps and various e-learning courses are very demanding (Parthasarathy, 2020). The schools cannot run with physical contact due to the pandemic. Everyone needs to keep a safe distance from another and create e-learning or distance learning programs for those the classes have not happened (Faherty et al., 2019). Ash and Davis (2009) illustrated that e-learning programs could be supported by various mediums like TV, internet, radio, email, etc., during the pandemic like Flu. Countries that are not having proper infrastructure related to the technologies in schools find it challenging to implement the e-learning infrastructure at the COVID-19 pandemic (Sintema, 2020).

### **Hypotheses and Conceptual Framework**

Taking the various constructs from previous theories and models (modified for e-learning), the author developed the following relationships separately for the teachers and the students. The author created a mediation-cum-moderation model for the same. It is a multi-group analysis of both the groups individually.

#### **Impact of Perceived Usefulness on Satisfaction and Behavioral Intention to Use**

Perceived usefulness can be described as the amount of enrichment added to the job performance when a new technology is employed to complete the job (Davis, 1989). It is always considered the primary antecedent of adopting new technology, especially e-learning (Salloum et al., 2019; Dash, Kiefer, & Paul, 2021; Dash & Chakraborty, 2021a; Tarhini, Hone, Liu, & Tarhini, 2017; Tan, Ooi, Sim, & Phusavat, 2012). Online learning usage and selection among clients is a complex problem for some schools, both in developed and developing nations, but it has been found that there is a lesser concern in developed countries about their learners’ ability to understand and use the e-learning system, as significant complex strides have only been taken, as per written works (Wilson & Berne, 1999). Alzahrani (2015) demonstrated that the complexities of introducing an e-learning system in developed countries remain a reality amid the computerized divide with developing countries. PU always plays a massive role in boosting the students’ and teachers’ satisfaction levels (Dash & Chakraborty, 2021a; Mahmodi, 2017; Hsia, Chang, & Tseng, 2014). Empirical evidence proves that PU positively affects the teachers’ and students’ satisfaction with e-learning (Islam, 2011). Similarly, the user’s perception of the technology’s usefulness automatically drives her to use the

same (Cheng, 2011; Dash & Chakraborty, 2021a; Salloum et al., 2019). Hence, it is proposed that:

H1(a): For the teachers, perceived usefulness has a significant and positive impact on satisfaction.

H1(b): For the teachers, perceived usefulness has a significant and positive impact on behavioral intention to use.

H1(c): For the students, perceived usefulness has a significant and positive impact on satisfaction.

H1(d): For the students, perceived usefulness has a significant and positive impact on behavioral intention to use.

### **Impact of Perceived Ease of Use on Satisfaction and Behavioral Intention to Use**

Perceived ease of use can be described as the perception of the degree of simplicity provided by the new technology to the user (Davis, 1989). According to Kenan, Pislaru, Othman, and Elzawi (2013), the primary reasons for the booming of Libya's e-learning activities are social, political, and financial imperatives. During ongoing years, planning and implementing e-learning frameworks have developed drastically (Hogo, 2010), and e-learning programs worldwide play a significant role in educating and teaching human beings (Franceschi, Lee, Zanakis, & Hinds, 2009). It executes as another preparation technique, which supplements customary strategies (Vaughan & MacVicar, 2004). Its last aspiration is to manufacture a propelled civilization for residents and support inventiveness and development (Kim & Santiago, 2005). This new outlook changes training from instructor-focused to student-focused (Lee, Yoon, & Lee, 2009). It has been found that an interactive video conferencing system has been introduced in the elementary schools in Greece, and it is providing good benefits for the students (Anastasiades et al., 2010). The recent effect of the Coronavirus on humanity accelerated e-learning in India (Saxena, 2020). Like PU, PEU is always considered to enhance the satisfaction level of the users (Salloum et al., 2019; Dash & Chakraborty, 2021a; Mahmodi, 2017). Further, if the user is confident about the ease of using the specific technology, her behavioral intention goes up (Tarhini, Hone, Liu, & Tarhini, 2017; Jaber, 2016; Salloum et al., 2019; Dash & Chakraborty, 2021a). In e-learning, PEU plays a considerable role in raising the user's satisfaction level and her behavior intention to use (Mohammadi, 2015). Hence, it is proposed that:

H2(a): For the teachers, perceived ease of use has a significant and positive impact on satisfaction.

H2(b): For the teachers, perceived ease of use has a significant and positive impact on behavioral intention to use.

H2(c): For the students, perceived ease of use has a significant and positive impact on satisfaction.

H2(d): For the students, perceived ease of use has a significant and positive impact on behavioral intention to use.

### **Impact of Satisfaction on Behavioral Intention to Use**

User satisfaction leads to a positive behavioral intention to use the technology (Dash, Kiefer, & Paul, 2021; Dash & Chakraborty, 2021a). When the technology fulfills the user's needs or desires, her satisfaction level goes up, and subsequently, her intention to use the product is positively influenced (Mohammadi, 2015). Major empirical studies have found that user satisfaction positively affects the behavioral intention to use (Hassanzadeh, Kanaani, & Elahi, 2012; Dash, Kiefer, & Paul, 2021a). Hence, it is proposed that:

H3(a): For the teachers, satisfaction has a significant and positive impact on behavioral intention to use.

H3(b): For the students, satisfaction has a significant and positive impact on behavioral intention to use.

### **Satisfaction as the Mediator**

Although both PU and PEU positively affect behavioral intention to use, they indirectly affect satisfaction (Dash & Chakraborty, 2021a; Salloum et al., 2019). The mediating role of satisfaction plays a huge role, especially when the behavioral intention is not significantly affected by the original determinants (Jaber, 2016). In e-learning, this finding is more crucial. Hence, it is proposed that:

H4 (a) (b): For the teachers, satisfaction plays the mediator between perceived usefulness, perceived ease of use, and behavioral intention to use.

H4 (c) (d): For the students, satisfaction plays the mediator between perceived usefulness, perceived ease of use, and behavioral intention to use.

### **Choice as the Moderator**

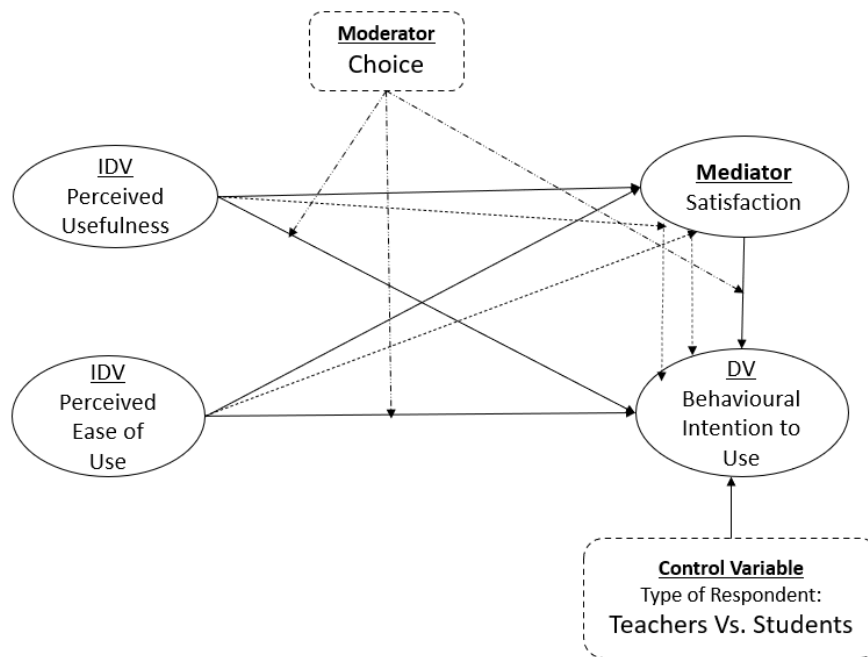
Similarly, an option must be provided to the users so that the outcome can be the best. The choice is considered a moderator in this study as it was felt that any e-learning technology must have alternatives for each feature and aspect (Dash & Chakraborty, 2021a; Bolliger & Wasilik, 2009). Option-less e-learning is boring and mundane, and it dampens the satisfaction level. Hence, the author has taken Choice as a moderator that influences the relationship of  $PU \rightarrow BIU$ ,  $PEU \rightarrow BIU$ , and  $SAT \rightarrow BIU$ . Therefore, it is proposed that:

H5 (a) (b) (c): For the teachers, choice moderates the relationship of perceived usefulness, perceived ease of use, and satisfaction with behavioral intention to use.

H5 (d) (e) (f): For the students, choice moderates the relationship of perceived usefulness, perceived ease of use, and satisfaction with behavioral intention to use.

All these hypotheses are depicted through a conceptual model in Figure 1.

Figure 1. Conceptual Framework



## Methodology Used

### Overview

As this study is part of a project work, the proposed model remains the same as the project. However, the focus was on the control variable for this study: type of respondent (teachers vs. students) and the difference in the estimated model for these two groups. First, the survey instrument was developed, and the collected data went through normality, reliability, and validity tests before running the SEM.

### Instrument Development

Data collection was conducted through a structured questionnaire. Two sections were developed in the same. The first one mainly contained demographic and control variables, and the second section included the five constructs with sixteen items under them. Each item was developed into a statement with the option provided in “Strongly Disagree=1” to “Strongly Agree=5” format. The constructs and the items with literature supports are provided in Table 1.

Table 1. Constructs, Items and Major Literary Works

Construct	Items Tuned for E-Learning	Contribution
Perceived Usefulness (PU)	<u>4 Items</u> useful; improves the effectiveness of learning; improves overall course effectiveness; improves my productivity.	Dash and Chakraborty (2021a); Lee, Yoon, and Lee (2009); Masrom (2007); Liaw (2008); Sánchez-Franco, Martínez-López, and Martín-Velicia (2009); Imamoglu (2007); Ong, Lai, and Wang (2004)
Perceived Ease of Use (PEU)	<u>3 Items</u> easy to use; easy to understand; easy to find information.	
Satisfaction (SAT)	<u>3 Items</u> satisfaction with resources and quality. satisfaction with the provider/ platform. satisfaction with the stakeholders (teacher/ student).	Dash and Chakraborty (2021a); Dash, Kiefer, and Paul (2021); Zhang, Cao, Shu, and Liu (2020); Dečman (2015); Venkatesh, Morris, Davis, and Davis (2003)
Behavioral Intention to Use (BIU)	<u>3 Items</u> prefer e-learning to traditional learning. willing to participate in other e-learning opportunities in the future. e-learning should be implemented in other courses/	
Choice (CHO)	<u>3 Items</u> use with own choice; happy with choice; not forced to choose.	Dash and Chakraborty (2021a)

Table 2. Participants in the Study

		Total					
		Type of Respondent					
		Teacher	%	Student	%	Total	%
Age (years)	<30	52	10.92	74	15.55	126	26.47
	31– 45	98	20.59	149	31.31	247	51.89
	>45	47	9.84	56	11.77	103	21.64
	Total	197	41.35	279	58.65	476	100
Gender	Male	122	25.63	149	31.31	271	56.94
	Female	75	15.72	130	27.34	205	43.06
	Total	197	41.35	279	58.65	476	100
Education	UG	0	0	141	29.62	141	29.62
	PG	91	19.11	127	26.68	218	45.79
	PhD	106	22.24	11	2.35	117	24.59
	Total	197	41.35	279	58.65	476	100

### Participants Details

As mentioned earlier, the data was collected as part of the e-learning project. Four hundred seventy-six respondents were finalized after the initial screening of the filled-in questionnaires. One hundred ninety-seven teachers and two hundred seventy-nine students from two nationalities (India and Saudi Arabia) were included. A hybrid sampling design was adopted that included stratification and convenience. Details of the participants are provided in Table 2.



### Instrument Assessment

Exploratory factor analysis was the first step to be conducted to generate the constructs, and five constructs with more than 73% variance explained (good enough with just approx. 26% loss of information) (Ruscio & Roche, 2012). Then, a confirmatory factor analysis (CFA) (see Figure 2) was run further with the help of IBM SPSS Amos 24 (IBM, 2016). Finally, model fit indices were assessed, which met the thresholds set by eminent researchers (Nunnally, 1994) (see Table 3). Composite reliability, Cronbach alpha, AVE, and MSV values were also extracted with the help of various testing methods, including the Fornell and Larcker criterion (1981) (see Table 4).

Figure 2 and Table 3 depict the model fit of the measurement model developed. CFA revalidates the EFA findings of good factor loadings for all the items under the obtained constructs. Table 4 further boosts our model. Both CR and Cronbach alpha are greater than 0.78 (minimum observed), much above the cut-off value of 0.7. AVE values for the five factors were greater than 0.58 (minimum observed), much above the cut-off value of 0.5. For each of the constructs, AVE was greater than MSV. With all these measures, the data can be said to be ready for further analysis, i.e., testing the hypotheses (Dash & Paul, 2021; Dash & Chakraborty, 2021b).

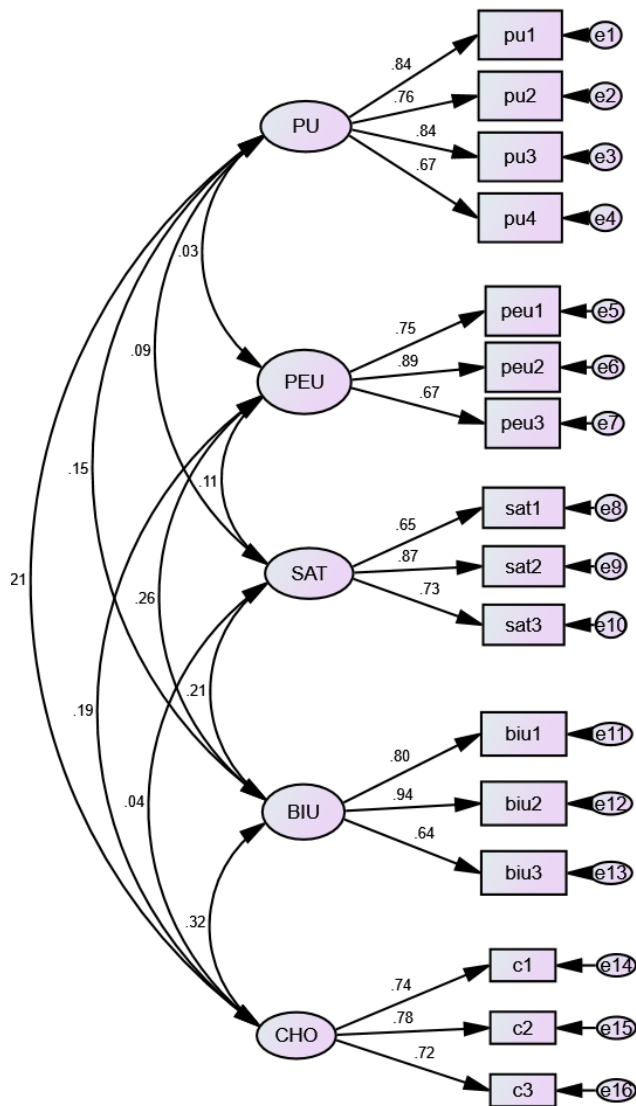
*Table 3. Goodness-of-Fit Measures for CFA*

Absolute Fit Measures	CMIN/df	2.95
	Goodness-of-fit Index (GFI)	0.93
	Adjusted goodness-of-fit Index (AGFI)	0.90
	Root mean square residual (RMSR)	0.06
	Root mean square error of approximation (RMSEA)	0.07
Incremental Fit Measures	Tucker-Lewis Index (TLI)	0.92
	Normed Fit Index (NFI)	0.91
	Comparative Fit Index (CFI)	0.94

*Table 4. Other Assessments of the Measurement Model*

	CR	Cronbach Alpha	AVE	MSV	BIU	PU	PEU	SAT	CHO
<b>BIU</b>	0.85	0.83	0.67	0.103	<b>0.806</b>				
<b>PU</b>	0.85	0.85	0.61	0.043	0.147	<b>0.782</b>			
<b>PEU</b>	0.82	0.81	0.60	0.066	0.256	0.029	<b>0.775</b>		
<b>SAT</b>	0.81	0.80	0.59	0.044	0.210	0.085	0.113	<b>0.759</b>	
<b>CHO</b>	0.79	0.78	0.58	0.103	0.321	0.207	0.190	0.040	<b>0.746</b>

Figure 2. CFA of the Constructs



## Results and Discussion

The conceptual model was synced with the empirical data to test the hypotheses, and a structural equation modeling-based path diagram was developed. Smart PLS 3.3.3 (Ringle et al., 2015) was used to do the same. Multi-group analysis was conducted to have a comparative look. Figures 3 and 4 represent the SEM path diagrams for the teachers and the students, respectively.

Figure 3. Path Analysis (Teachers)

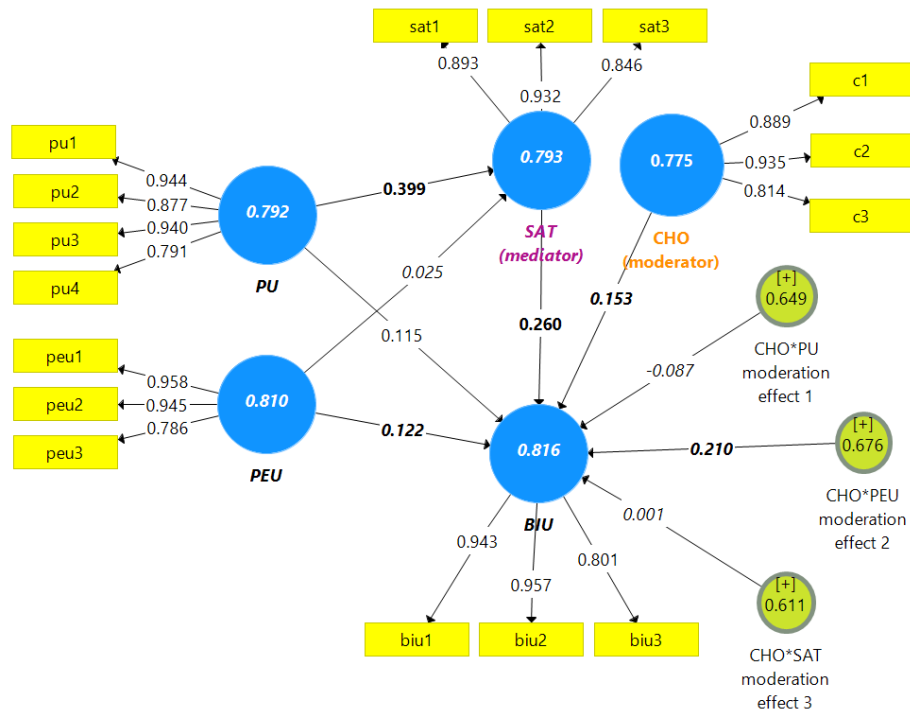
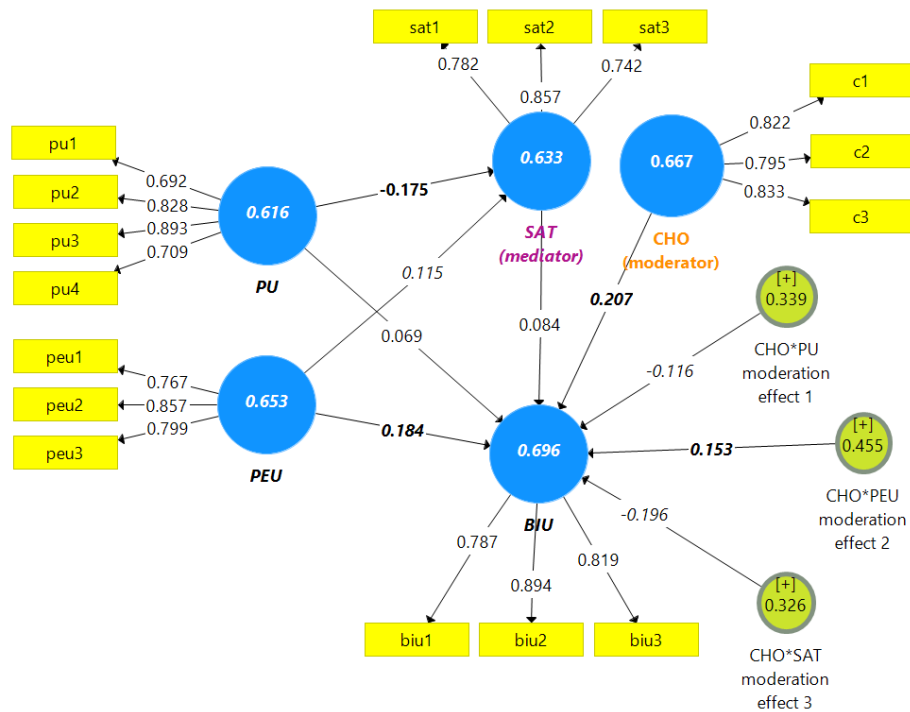


Figure 4. Path Analysis (Students)



Teachers: It has been found that perceived usefulness has a significant and positive impact on satisfaction, and perceived ease of use does not impact satisfaction significantly. Hence, H1 (a) is accepted, but H2 (a) is not accepted (see Figure 3, Tables 5-6). Here satisfaction is the mediator and choice as the moderator. Perceived ease of use significantly impacts behavioral intention, whereas perceived usefulness has a non-significant effect on behavioral intention. Hence, H1 (b) is not accepted, but H2 (b) is accepted (see Figure 3, Tables 5-6). Further, satisfaction too hugely affects behavioral intention to use. Hence, H3 (a) is accepted (see Figure 3, Table 7).

Students: It has been found that perceived usefulness has a significant but negative impact on satisfaction, and perceived ease of use does not impact satisfaction significantly. Hence, both H1 (c) and H2 (c) are not accepted (see Figure 4, Tables 5-6). Here satisfaction is the mediator and choice as the moderator. Perceived ease of use significantly impacts behavioral intention, whereas perceived usefulness has a non-significant effect on behavioral intention. Hence, H1 (d) is not accepted, but H2 (d) is accepted (see Figure 4, Tables 5-6). Further, satisfaction does not affect behavioral intention to use it significantly. Hence, H3 (b) is not accepted (see Figure 4, Table 7).

Table 5. H1: PU on SAT & BIU (Teachers and Students)

Hypothesis	Hypothesized Relationship			Estimate	Accepted/ Rejected
H1(a)	PU (T)	→	SAT (T)	<b>0.39**</b>	Accepted
H1(b)	PU (T)	→	BIU (T)	0.11	Rejected
H1(c)	PU (S)	→	SAT (S)	<b>-0.17*</b>	Rejected
H1(d)	PU (S)	→	BIU (S)	0.06	Rejected

\*\* p < 0.01; \* p < 0.05

Table 6. H2: PEU on SAT & BIU (Teachers and Students)

Hypothesis	Hypothesized Relationship			Estimate	Accepted/ Rejected
H2(a)	PEU (T)	→	SAT (T)	0.02	Rejected
H2(b)	PEU (T)	→	BIU (T)	<b>0.12*</b>	Accepted
H2(c)	PEU (S)	→	SAT (S)	0.11	Rejected
H2(d)	PEU (S)	→	BIU (S)	<b>0.18**</b>	Accepted

\*\* p < 0.01; \* p < 0.05

Table 7. H3: SAT on BIU (Teachers and Students)

Hypothesis	Hypothesized Relationship			Estimate	Accepted/ Rejected
H3(a)	SAT(T)	→	BIU (T)	<b>0.26**</b>	Accepted
H3(b)	SAT(S)	→	BIU (S)	0.08	Rejected

\*\* p < 0.01; \* p < 0.05

The first three hypotheses provided an exciting picture. PU has a substantial impact on the users' satisfaction. Nevertheless, the similarity stops here. Teachers have a positive perception of usefulness, whereas students have a distinct negative perception. In this study, it was clear that the students think negatively about the usefulness of e-learning technology. The primary reason might be hidden in the

demographic variables, which should be explored in future studies. However, this result is unexpected and not in line with existing studies too.

It should be noted that the study was conducted during a pandemic, and there might be many other factors responsible for the same. Regarding the teachers, the finding aligns with the previous literature (Dash & Chakraborty, 2021a; Mahmodi, 2017; Hsia, Chang, & Tseng, 2014). PU has no significant impact on BIU for both groups. Both the teachers and the students positively perceive usefulness's effects on behavioral intention, yet not significantly. There is not much difference between both groups. This finding aligns with the previous literature, although many studies had reported significant impacts (Cheng, 2011; Dash & Chakraborty, 2021a; Salloum et al., 2019). PEU has no significant effect on satisfaction (for both teachers and students) but affects BIU significantly (for both groups). Satisfied or not, all the users perceive ease of use as a significant factor that affects their final behavioral intention to use. This finding provides many implications for the service providers to raise the PEU quotient to gain customers. Satisfaction might not be essential as presumed as the findings in general indicate. This finding aligns with the previous literature (Tarhini, Hone, Liu, & Tarhini, 2017; Jaber, 2016; Salloum et al., 2019; Dash & Chakraborty, 2021a). Teachers consider satisfaction has a significant role in shaping their BIU, but students do not think so. The finding is closely linked to the students' negative perception of usefulness in enhancing satisfaction. Although the students disagree with the teachers for this hypothesis, the result is still positive. It might be improved with a more extensive and diverse sample from the students. This finding aligns with the previous literature (Hassanzadeh, Kanaani, & Elahi, 2012; Dash, Kiefer, & Paul, 2021). The underlying difference can be explained clearly through the following hypothesis that tests the mediation role of satisfaction.

### **Satisfaction as the Mediator**

As it was clear from the third hypothesis that satisfaction had no impact on BIU (students), it encouraged the author to find out the mediation effects of satisfaction. Results of the mediation effects are provided in Table 8. Both the direct and indirect effects are assessed. The same is done by bootstrapping and calculating indirect effects with significance levels. It was found that SAT had a significant indirect impact on the relationship:  $PU(T) \rightarrow SAT(T) \rightarrow BIU(T)$ .

Nevertheless, for all other mediated relationships, the indirect effect was negligible. Hence, H4 (a) is accepted, and H4 (b) (c) (d) is not accepted. The result was expected as it was already known that PU does not affect BIU significantly but hugely affects SAT. Further, SAT has a significant effect on BIU. Therefore, it can be concluded that teachers perceive usefulness as a critical factor for their satisfaction, which affects BIU significantly even though it has no direct impact on BIU.

Table 8. Satisfaction as the Mediator

Relationship	Hypothesis	Direct Effect	Indirect Effect	Result
$PU(T) \rightarrow SAT(T) \rightarrow BIU(T)$	H4 (a)	0.11	<b>0.10**</b>	Full
$PEU(T) \rightarrow SAT(T) \rightarrow BIU(T)$	H4 (b)	<b>0.12*</b>	0.01	No
$PU(S) \rightarrow SAT(S) \rightarrow BIU(S)$	H4 (c)	0.06	-0.00	No
$PEU(S) \rightarrow SAT(S) \rightarrow BIU(S)$	H4 (d)	<b>0.18**</b>	0.00	No

\*\* p < 0.01; \* p < 0.05

Table 9. Moderation Effects of Choice

Effect of "Choice" on the Relationship	Hypothesis	Estimate	Accepted/ Rejected
$PU(T) \rightarrow BIU(T)$	H5(a)	-0.08	Rejected
$PEU(T) \rightarrow BIU(T)$	H5(b)	<b>0.21**</b>	<b>Accepted</b>
$SAT(T) \rightarrow BIU(T)$	H5(c)	0.00	Rejected
$PU(S) \rightarrow BIU(S)$	H5(d)	-0.11	Rejected
$PEU(S) \rightarrow BIU(S)$	H5(e)	<b>0.15*</b>	<b>Accepted</b>
$SAT(S) \rightarrow BIU(S)$	H5(f)	-0.19	Rejected

\*\* p < 0.01; \* p < 0.05

### Choice as the Moderator

The author introduced choice as a new construct in a recent related study and used it as a moderator to the relationship between PU, PEU, SAT, and BIU (Dash & Chakraborty, 2021a). Table 9 shows that the moderation effect of choice is almost the same for both teachers and students. Choice moderates the relationship between PEU and BIU for both the teachers and the students, whereas it has no role in other relationships. Hence, H5 (b) (e) are accepted, and all other hypotheses are rejected. CHO (T) strengthens the positive relationship between PEU (T) and BIU (T). Similarly, CHO (S) strengthens the positive relationship between PEU (S) and BIU (S) too. The moderation effects are visualized in Figures 5 and 6.

Figure 5. Graphical Representation of Moderating Influence of Choice on PEU (Teachers): H5(b)

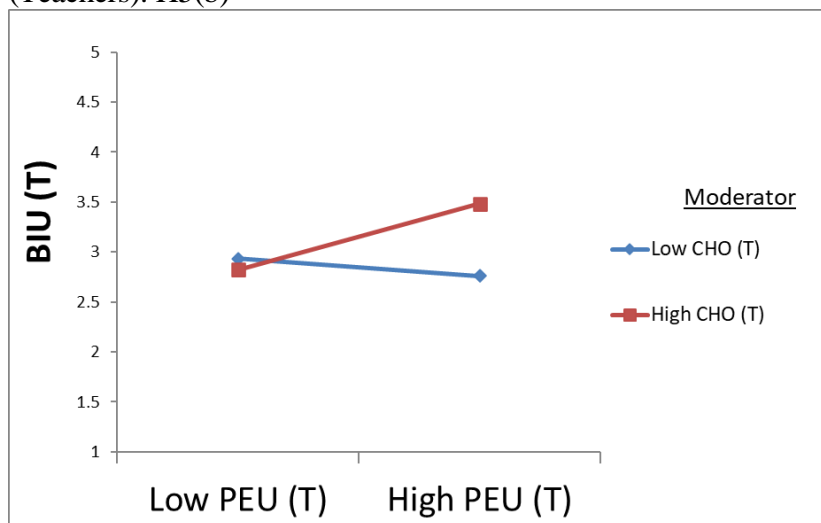
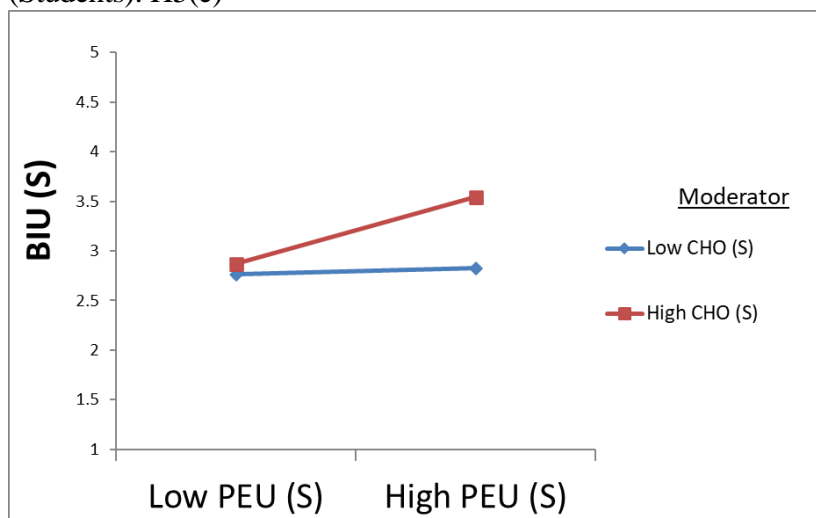


Figure 6. Graphical Representation of Moderating Influence of Choice on PEU (Students): H5(e)



### Implications & General Discussion

Teachers must utilize this period to boost their skill sets. They can contribute to research to find better and more practical solutions. They can explore different LMS platforms to understand essential tools and features (Dash, Akmal, & Wasiq, 2021). Curriculum enrichment is one of the significant tasks that teachers must do to adapt to e-learning. Teachers must act as mentors in online interaction and support the success path of the students. As physical interaction is limited, teachers must present course clarity and structure with an excellent online presence. The learning community concept must be strengthened with a heavy online presence with AI tools. E-learning requires agile and learned educators. Hence, they must be well prepared to solve queries instantly with online discussion boards. Lack of preparation might result in embarrassment for the educators and the institutions. Learning analytics must be used to understand and execute the changes needed. Online resources must be shared abundantly to support the students' activities and engagement. Continuous communication is a must through various online tools for suitable intervention when required.

Similarly, students must perform their tasks as desired by the teachers. They should act as true mentees to the mentors. Maximum utilization of the LMS tools to solve their issues and problems should be promoted. Proper attention in the online sessions should be given. Timely submissions of tasks such as assignments and assessments must be followed. Unrelated queries or discussions must be avoided. Digital fatigue should be reduced by engaging in other activities. Administrators play a massive role in these times. They must facilitate the interaction of the teachers and students by providing necessary support. All the non-teaching activities must be supported and solved by them. Numerous problems faced by the teachers and students must be solved through an online grievance solution mechanism. Many Saudi Universities, especially, SEU have a

robust digital infrastructure for the same. Indian institutions lack the necessary means for the same. Both Governments must step in wherever required, especially when enforcement of regulations is required.

Similarly, many institutions with access to LMS implemented online teaching. However, many Universities struggled for few days to put everything in place. SEU led this process by imparting training and providing technical support to needy institutions. The government launched many online platforms to support e-learning for all levels starting from primary to university levels. Now, classes are being conducted through various LMS (Blackboard, Moodle, Canvas, etc.), assessments are being conducted through the same LMS or dedicated applications like Swiftassess (GamaLearn), and use of online meeting platforms (Webex, Zoom, Google Meet, etc.) are booming. In addition, social media are being used for imparting educational purposes. Schools in Saudi Arabia have started using platforms launched by the Government and private players like Classera (Dash & Chakraborty, 2021a).

In India, the reputation of e-learning is growing as it brings about a change in perspective in students' lives. This sharpens the students' abilities while offering the ease of learning anytime, anywhere! It has opened fresh avenues for students headed to explore and learn at their speed and time. There is an enormous opportunity for creativity to be integrated into the teaching industry, students' liking for new advancements and products increases. The development of virtual instruction in India is backed by growing discretionary cash flow, decreased online training expense, internet infiltration, cell phone client base, and expanded employability. Instructive examples also evolve quickly: few freelance students, few progressive students, and students from varied backgrounds. Besides student learning, ICT in education is being used to enhance inventiveness, teamwork, and knowledge sharing. ICT in training educational plans for students and instructors has been developed and introduced worldwide at the national level (Mehta, 2021; Sudevan, 2020). To view and distribute all instructive e-assets, NCERT developed an ePathshala. The presentation of SWAYAM contains another significant development by GoI. SWAYAM offers a single platform for online courses that utilize ICT and covers all advanced education subjects and aptitude division courses to ensure the availability of high-quality advanced education at an affordable cost. E-learning is funded by the Government of India (GoI). GoI has effectively developed apparatuses and inventions to advance it despite this. Substance growth, R&D innovation, human resource development programs, and staff training initiatives to enhance proficiency are examples of these activities. To reach out to people from all walks of life, the Indian government recently launched the PM e-VIDYA stage, which includes new DTH channels, one for each class. Such attempts have shown that a substantial part of the school population is profitable. In the wake of the COVID-19 emergency, India sees an eLearning blast (Sudevan, 2020).



### **Limitations & Future Directions**

Although the author tried our level best during this pandemic, this study encountered few limitations that can be addressed in future studies. To begin with, although the researcher received enough responses to make a good study, around 700 samples were expected. The primary reason behind the same was the digital fatigue of the respondents. Secondly, it was planned to include physical expert opinion mechanisms in both countries, which were partially successful due to extended lockdowns and shutdowns. Thirdly, the time constraint of 6-9 months limited our venture and cut-short a comprehensive model to a manageable model. This provides a golden opportunity to include all the antecedents and consequents in a future study. Finally, our own digital and mental fatigue caused huge issues to maintain the momentum in two countries with multiple factors.

This study provides a massive opportunity for future research works. The author has considered teachers and students as the stakeholders. Nevertheless, administrators and platform providers can also be considered in the future. Although this study is the first to compare two Asian nations, there can be a developed vs. developing country approach with more nations involved. Specific impacts of demographic and socioeconomic factors must be investigated in detail. More antecedents and consequents of the existing constructs should be explored. For teachers and students, the model need not be the same. Individual models with distinct features must be developed with empirical evidence.

### **Conclusion**

The primary objective of the study was simple. The author tried to assess the impact of the pandemic and subsequent adoption of e-learning by two stakeholders: teachers and students and the differences. Almost two hundred teachers and three hundred students from two countries were considered for this study. Two other objectives: satisfaction as a mediator and role of choice as a moderator in shaping the perceptions and the resultant differences, were also discussed. A new modified model was developed, and PLS-SEM was used to validate the same. Results show that teachers' perceived usefulness has a significant and positive impact on their satisfaction. Perceived ease of use has a substantial and positive impact on the behavioral intention of both teachers and students. Satisfaction is a successful mediator for teachers but not for the students. Choice has proved to be a good moderator (for both teachers and students) for the relationship between perceived ease of use and behavioral intention to use. In this study, it was clear that the students think negatively about the usefulness of e-learning technology. The primary reason might be hidden in the demographic variables, which should be explored in future studies. This result is unexpected and not in line with existing studies too.

The current pandemic will go away sooner or later, but the transition to e-learning might not be reversing soon. Blended learning will be the benchmark of

future learning modes. Teachers and students must evolve and adapt to this new normal of the post-COVID higher education sector.

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