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Measuring the Impact of Students' Attitude towards Adoption of Online Classes during COVID 19: Integrating UTAUT Model with Perceived Cost

Prashant Tiwari, Assistant Professor, Institute of Business Management, GLA University, Mathura, Uttar Pradesh. INDIA

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Abstract:
The impact of COVID 19 has changed the education system forever. The COVID 19 has resulted in schools and universities shut all across the world. The students from every corner of the globe are now out of their classrooms, as a result the education and classroom teaching has changed dramatically, with the unique rise of e-learning, whereby teaching is undertaken distantly and on online platforms. Therefore, the main aim of conducting this study is to examine core factors affecting the University students' attitude towards adoption of online classes. The study is based on the Unified Theory of Acceptance and Use of Technology model (UTAUT) explaining the relationship of students' attitude towards online classes. Along with the constructs of UTAUT model (Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions) the items of Perceived Cost are also included. Online questionnaires were administered to 430 Under Graduate students at GLA University, Mathura(India). Multiple Regression technique was applied and the results suggested that Performance Expectancy, Effort Expectancy and Facilitating Conditions have a strong and significant impact where as Social Influence showed weak but significant impact on Behavioural Intention towards adoption of online classes. Perceived Cost was found insignificant. The variance explained by extended UTAUT model on Behavioural Intention towards adoption of online classes is 62.3 %.

Keywords: *UTAUT, Online Education, COVID 19, Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC) and Perceived Cost (PC).*

Abbreviations: Unified Theory of Acceptance and Use of Technology model (UTAUT), Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Perceived Cost (PC), Behavioural Intention (BI), Corona Virus Disease (COVID), United Nations Educational, Scientific and Cultural Organization (UNESCO), Information and communications technology (ICT), Technology Acceptance Model (TAM), Combined Technology Acceptance Model (C-TAM), Theory of Planned Behaviour (TPB), Motivational Model (MM), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT) and Theory of Reasoned Action (TRA).

I. INTRODUCTION

The first human infected case of COVID 19 was found in Wuhan, China in December 2019. Gradually in few months, it embraced and affected the entire world. The impact is such diverse that all corners of the globe havebeen negatively affected.It has also impacted the education system forever. The COVID 19 has resulted in schools and universities shut all across the world. The students from every corner of the globe are now out of their classrooms, as a result the education and classroom teaching has

TEST Engineering & Management

May-June 2020
ISSN: 0193-4120 Page No. 8374 - 8382

changed dramatically, with the unique rise of e-learning, whereby teaching is undertaken distantly and on online platforms. As per UNESCO Institute for Statistics Data- 1,268,164,088 are affected learners from 177 countries.The data represent a huge number in India of the students in Higher Education [11].

Table 1: Number of Affected Learners in India By COVID 19

GLOBAL MONITORING OF SCHOOL CLOSURES CAUSED BY COVID 19			
Country	**India**		
Affected Learners	**320713810**		
Total Females	**158158233**		
Total Males	**162555577**		
School Type	**Females**	**Males**	**Total**
Tertiary(Higher Education)	**16739686**	**17597908**	**34337594**

Note: "Figures correspond to number of learners enrolled at pre-primary, primary, lower-secondary, and upper-secondary levels of education [ISCED levels 0 to 3], as well as at tertiary education levels [ISCED levels 5 to 8]. Enrolment figures based on latest UNESCO Institute for Statistics data."[11]

With this sudden shift away from the classroom in many parts of the globe, some are wondering whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the worldwide education market.Therefore, moving to a digital platform for higher education is the need of the hour. In India, at present majority of the universities are moving to online education through various software and application such as zoom, blackboard, Skype, you tube etc.

A study was conducted to compare the usage of online learning system such as WebCT, Blackboard and OSS Moodle, and found that commercial software are better in terms of technical support[4].A research study was carried out which highlighted the significance of proper planning and management involvement in technology integration in educational settings[12]. If this is not heeded, it will either slow down a project or lead to its outright failure. Another research study pointed out, conditions which can facilitate innovative teaching and learning include ensuring that learning goals are achievable using the ICT tools; using ICT tools as one resource among others, which may include provision of professional development and technical support, making equipment available, and working to change teacher negative beliefs about ICT in teaching and learning[31]. Students appear to be open-minded about the prospect of using Facebook for educational purposes [16, 21].

However, despite the potential and general enthusiasm for Facebook, it has not been taken up extensively in education yet.Another studyindicated that the use of ICT may facilitate innovative teaching and learning practices in educational settings [13].Therefore, the main aim of conducting this study is to examine core factors affecting the University students' attitude towards adoption of online classes during COVID 19.

II. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

UTAUT model developed in 2003 is one of the most widely used model for technology acceptance which includes "three direct determinants of intention to use (performance expectancy, effort expectancy, and social influence) and two direct determinants of usage behaviour (intention and facilitating condition)"[30]. UTAUT was a result of various theories and constructs which were found significant and relevant for individual's technology adoption and their role in influencing behavioural intentions towards actual use of the technology. This model has been found to perform better other technology acceptance models explaining up to 70% of variance

May-June 2020
ISSN: 0193-4120 Page No. 8374 - 8382

in BI in many previous researches [30]. In a study conducted on school students, UTAUT model along with additional constructs explained a variance up to 51.3% in influencing BI towards online blogs [27].

UTAUT model includes the various constructs from many theories such as Technology Acceptance Model (TAM), Combined Technology Acceptance Model (C-TAM), Theory of Planned Behaviour (TPB), Motivational Model (MM), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT) and Theory of Reasoned Action (TRA). Previous theories and related constructs were evaluated, compared and analysed and the similar findings were combined to build UTAUT model as shown in Table: 2 along with the definition of the various constructs thus framed.

Table: 2- UTAUT Model Constructs and Theories

Core Constructs & Definition	Constructs and Theories	References
Performance Expectancy:- "The degree to which an individual believe that using the system will help him or her attain gains in job performance." [30]	Perceived Usefulness (TAM/TAM2 and C-TAM-TPB)	[6,8]
	Extrinsic Motivation (MM)	[7]
	Job-fit (MPCU)	[26]
	Relative Advantage (IDT)	[17]
	Outcome Expectations (SCT)	[5]
Effort Expectancy:- "The degree of ease associated with the use of the system."[30]	Perceived Ease of Use (TAM/TAM2)	[6,8]
	Complexity (MPCU)	[26]
	Ease of Use (IDT)	[17]
Social Influence:- "The degree to which an individual perceives that important others believe he or she should use the new system." [30]	Subjective Norm (TRA, TAM2, TPB and C-TAM-TPB)	[9,2,8,24]
	Social Factors (MPCU)	[26]
	Image (IDT)	[17]
Facilitating Conditions:- "The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system." [30]	Perceived Behavioural Control (TPB and C-TAM-TPB)	[2, 24]
	Facilitating Conditions (MPCU)	[26]
	Compatibility (IDT)	[17]

A study based on UTAUT conducted in Indonesia suggested that age and gender were found not moderating the PE, EE and SI [20]. The findings of the research 'Assessing User Acceptance toward Blog Technology Using the UTAUT Model' analysed and suggested that e-learning is able to attract and retain the students' interest and attention[20]. They have positive views regarding the suitability of e-learning media for Collaboration and knowledge sharing. Study explained that Social Influence (SI) proved to be a strong booster for students to use blogs in online teaching and learning process.Various eminent studies have suggested that PE explained a significant positive impact on the BI [28, 8, 30]and one of the strongest predictor for explaining the relationship with BI [1]. A study titled "A Model of ICT Acceptance and Use for Teachers in Higher Education Institutions "suggested that all four constructs of UTAUT model were found strong predictor of BI whereas PEwas found to be the most influential one towards the adoption and use of ICT among teachers [18].PC can be understood as the measure which an individual believes that using banking services from m-banking facility is costlier as compared to other modes [15].PC plays a significant role if customer

May-June 2020
ISSN: 0193-4120 Page No. 8374 - 8382

feels that cost of using any service is high than it may have the reduction in adoption of that facility [15, 22].Various previous studies have included other factors along with UTAUT constructs and analyzed but PC found to be an important factor. PC plays a very important role as adoption of online classes cannot be possible without installation of a high speed internet connection, purchasing of laptop/desktop or a smart device. For this, the students may have to bear a cost. Therefore, PC has been considered for this study. Therefore, considering this as this research gap extending this students' attitude towards adoption of online classes, the following hypotheses are framed:

"H1: Performance Expectancy will have a significant positive influence on students' intention to attend online classes."

"H2: Effort Expectancy will have a significant positive influence on students' intention to attend online classes."

"H3: Social Influence will have a significant positive influence on students' intention to attend online classes."

"H4: Facilitating Conditions will have a significant positive influence on students' intention to attend online classes."

"H5: Perceived Cost will have a significant negative influence on students' intention to attend online classes."

The study proposes a research model to examine the influence of UTAUT Model constructs i.e., PE,EE,SI & FC along with PC on BI to examine core factors affecting the University students' attitude towards adoption of online classes. In specific, the objective of the study is to examine the influence of PE, EE, SI, FC and PC on BI of attending online classes by University students.

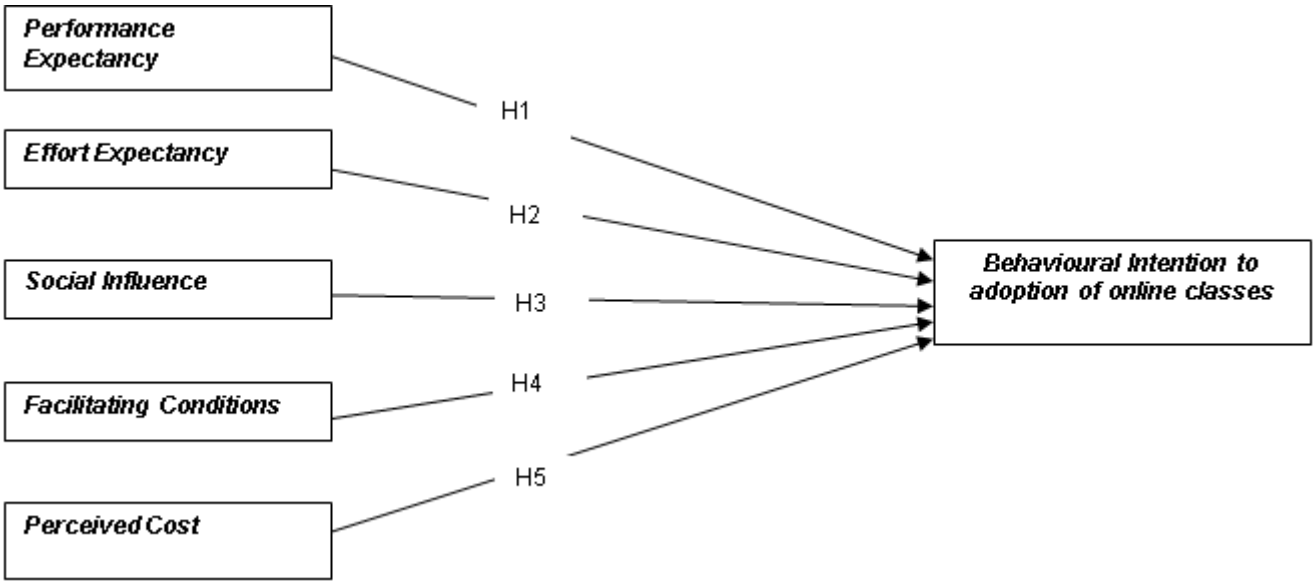

Figure 1: Research Framework

III. RESEARCH METHODOLOGY

Data for the study was collected by means of online questionnaire. Google forms were used to create the online questionnaire and link was circulated among the Under Graduate students at GLA University, Mathura (India).Responses taken from 430 students were considered for the study out of which 244

May-June 2020
ISSN: 0193-4120 Page No. 8374 - 8382

(56.7 %) were males and 186 (43.3 %) were female students. It was also asked about the mode used for attending online classes which reflected that 387(90%) students were using mobile phones and 43 (10%) laptops/desktops. The questionnaire was divided into two parts,(A) including gender and mode used for attending online classes. The second part (B) consists of 20 items on a 5 point Lickertscale ranging from 1- Strongly disagrees to 5 – Strongly Agree.Constructs and their corresponding items are shown in Table 3. IBM SPSS software was used for checking the reliability of the adopted scale and applying multiple regression analysis on the collected data.

Table: 3- Constructs and Corresponding Items

Item No.	Item Name		Item Source
	Performance Expectancy(PE)		[30]
1	PE1	"I believe that attending online classes could improve my academic results".	
	PE2	"I think that attending online classes could improve my academic performance."	
	PE3	"Attending online classes could accelerate my academic performance."	
	PE4	"Attending online classes could be beneficial to my learning activities."	
	Effort Expectancy(EE)		
2	EE1	"Attending online classes are probably easy to use."	
	EE2	"Attending online classes are easy for me."	
	EE3	"Attending online classes are understandable."	
	Social Influence(SI)		
3	SI1	"People who are important to me think that I should attend online classes."	
	SI2	"People who affect my learning think that I should attend online classes."	
	SI3	"I expect to attend online classes because people around me do."	
	SI4	"Not attending online classes is falling behind others."	
	Facilitating Conditions(FC)		
4	FC1	"I sense the need to attend online classes to advance my education."	
	FC2	"I have the knowledge to take advantage of online classes."	
	FC3	"Online classes are suitable to the way I like to do things."	
Perceived Cost (PC)			[3, 14, 15, 32 & 33]
5	PC1	"I believe that attending online classes are very expensive."	
	PC2	"I would have financial barriers (e.g. cost of internet	

TEST Engineering & Management

May-June 2020
ISSN: 0193-4120 Page No. 8374 - 8382

		connection, laptop etc) in order to attend online classes."	
	PC3	"It takes time to go through the process of moving to a new means of learning."	
	Behavioural Intention (BI)		
6	BI1	"I prefer to attend online classes."	[15, 23 & 29]
	BI2	"I intend to attend online classes."	
	BI3	"I will attend online classes."	

IV. DATA ANALYSIS AND RESULTS

To verify the reliability of the items, Cronbach alpha coefficient was calculated. The values of all the constructs used i.e, PE, EE, SI, FC and PC ranged between 0.701 to 0.929, satisfying and exceeding the value recommended of 0.70, are worthy of adoption as true measures of the variables they represent[10, 19]. The reliability value for the variables is shown in Table:4.

Table: 4- Cronbach's α vlaue

Construct	Cronbach's α
Performance Expectancy	.929
Effort Expectancy	.772
Social Influence	.705
Facilitating Conditions	.827
Perceived Cost	.701
Behavioural Intention	.828

Table:5 -Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.627	.623	.65444
a. Predictors: (Constant), PC, EE, SI, FC, PE				

Table: 6- ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	305.710	5	61.142	142.759	.000[b]
	Residual	181.594	424	.428		
	Total	487.305	429			

a. Dependent Variable: BI

b. Predictors: (Constant), PC, EE, SI, FC, PE

Table: 7 - Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

TEST Engineering & Management

May-June 2020
ISSN: 0193-4120 Page No. 8374 - 8382

1	(Constant)	-.190	.161		-1.179	.239
	PE	.277	.059	.250	4.728	.000
	EE	.192	.046	.176	4.143	.000
	SI	.098	.053	.078	1.841	.066
	FC	.424	.051	.392	8.297	.000
	PC	.011	.034	.010	.336	.737

a. Dependent Variable: BI

The results of the study explains that PE,EE and FC have a strong and significant impact where as SI showed weak but significant impact on BI compared to above mentioned constructs of UTAUT model. The findings of the study are in alignment with various previous studies explaining the results that PE, EE and FC are strong predictor of BI [28,8,&30]. This study also showed the insignificant impact of PC towards BI which is in contrary to the various previous studies where PC has shown in significant impact on BI[15, 22]. The variance explained by extended UTAUT model to BI is 62.3 % as shown inTable: 5- Model Summary in Adjusted R Square column. Table: 7 is reflecting the negative coefficient value of -.190 and suggesting that PE, EE and FC are found significant at .05 % whereas the SI is weak but significant at .10 %. PC is found insignificant as the value is .737. This can also be summarized in the results of hypothesis table.

Table: 8- Result of Hypothesis

Hypothesis	Result
"H1: Performance Expectancy will have a significant positive influence on students' intention to attend online classes."	Accepted
"H2: Effort Expectancy will have a significant positive influence on students' intention to attend online classes."	Accepted
"H3: Social Influence will have a significant positive influence on students' intention to attend online classes."	Accepted
"H4: Facilitating Conditions will have a significant positive influence on students' intention to attend online classes."	Accepted
"H5: Perceived Cost will have a significant negative influence on students' intention to attend online classes."	Rejected

V. CONCLUSION

This empirical study is based on UTAUT model as a medium that is extended to include PC as an important factor. PC plays a very important role as adoption of online classes cannot be possible without installation of a high speed wi-fi or internet connection, purchasing of laptop/desktop or a smart device. For this, the students may have to bear a cost. Therefore, PC has been considered for this study. In support with the previous eminent research studies, findings suggested that PE, EE and FC have a strong and significant impact where as SI showed weak but significant impact on BI compared to above mentioned constructs of UTAUT model [28, 8, &30]. This study also showed the insignificant impact of PC towards BI which is in contrary to the various previous studies where PC has shown insignificant impact on BI [15, 22].

VI. FURTHER SCOPE AND LIMITATIONS OF THE STUDY

The study is limited to only Under Graduate students belonging to a particular field of Management& Commerce.Further studies with students across various universities and other fields such as engineering, pharmacy and medical,

May-June 2020
ISSN: 0193-4120 Page No. 8374 - 8382

diploma should be conducted so as to examine the results derived from this study can be generalized to the students of the same age group. Future studies can also be conducted to improve the variance explained so that BI can be improved. Moreover, this study dealt only with the online learning but further studies can also include blended methods of learning.

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CONFLICT OF INTEREST: The author of this study declares that he has no conflict of interest.

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