STUDY OF TECHNOLOGY ACCEPTANCE BY SCHOOL STUDENTS DURING COVID ERA

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ABSTRACT

The technology acceptance model gives insight about the factors that influence adoption of technology for various purposes. The present study sought to understand the technology acceptance criteria by school students of central India. The study used quantitative methods to analyse use of digital medium by the 561 students at the remote locations they are at, for learning. The study revealed that the perception about ease to use and usefulness of technology develop a positive attitude of students towards technology. Students with positive attitude have clear behavioural intention to use technology and which subsequently enhance actual usage of technology.

Keywords: TAM, PLS SEM, School Education, Technology, Attitude, Ease of use, Perceived Usefulness.

INTRODUCTION

The year 2020 has changed the world. The world is locked inside their houses. The lock schools, colleges and universities were locked and students were forced to sit at the home and learn with the help of technology. Till 2020 people were dependent on traditional methods of teaching and learning and they were of view that no other option is better than traditional face to face learning. The broke out of pandemic has changed the teaching and learning process entirely.

The present study is conducted on the students of school who were studying from standard 9th to 12th who were not that much used to technology for studying. They knew only class room teaching at school as well as for other supporting classes. Though many people still of opinion that traditional method of teaching are best but they also agree that technology has widened the classroom, it has opened endless possibilities for learning.

Technology has impacted very sphere of life and education is not an exception. It has changed role of teacher and students. It has changed the classroom, it has transformed instructional materials and it has transformed education in many ways. This change is more evident in present time of pandemic. In this pandemic era education with the help of technology has become inevitable. Previously technology was used by university students or professionals in order to get part time degree or some supportive degrees now the school students are also using it not only for compulsory classes but also for additional courses. The e learning has increased too much or say it is the only method of learning now a days. E learning can be defined in various ways. It is also known as online learning, web based leaning or internet based leaning method.

The E leaning is any form of education which is conducted or facilitated with the help of internet. It can also be defined as internet based learning management system which is self-contained webpage that help in student's engagement in leaning is the only way which made teaching, learning and training feasible. Technological advancement has made it possible for students and schools to continue their teaching and learning process in the phase of lockdown.

The use of technology has increased many folds at various levels of teaching. The teachers are using technology to teach students who have just started their educations and trainers are using it to train the employees. The people are accepting the technology according to their environment and this had been an area of interest by social scientist.

A fair amount of work has already been done in technology acceptance area. Technology Acceptance Model is a very popular field of research when it comes to digital payments, e commerce, online meetings or e conferences etc but still there is a gap in existing knowledge is there regarding representation of academics specifically school students (aged between 12 to 18 years of age). The technology has become an attractive trend in university education; still whether it is equally attractive to school students is to be studied. The large percentage of educational research on TAM emerges from Asia, where digital methods have been checked in countries such as Taiwan, Malaysia, South Korea and China to demonstrate their prospects to improve teaching and learning. With the same aim and similar research perspectives, Europe , North America, the Middle East and Africa follow. The focus area of this research is central Indian region which has not been studied before.

Technology acceptance model (TAM) was developed by Davis in year 1989. The TAM was based on psychological mode know as Theory of reasoned behavior (TRA) given by Fishbein and Azen in year 1975, in which they said that behavioural intention was decided by attitude and environmental factors which in turn decide individual attitude. TAM was a development over TRA. TAM proposed that perceived ease of use (PEU) and perceived usefulness (PU) decides attitude regarding use of technology. Behavioural intentions and actual usage can be predicted on the basis of PEU and PU. Attitude towards technology itself has effect on behavioural intention towards using technology in any field which in the end predicts actual usage of technology.

REVIEW

TAM has been tested in various fields and recent review says that TAM has proved its effectiveness in education technology also. The Technology Adoption Model (TAM) is not a novel research subject for researching the acceptance of e-learning, and several academics have tackled it. Nevertheless the development of a systematic TAM that will be able to analyse the adoption of e-learning in certain conditions is considered to be a crucial research path (salloum et al. 2019).

Perceived usefulness is perception or belief about usefulness of a new technology that will be improving the results like learning in this study. Usefulness is an important factor deciding attitude towards use of technology (Chang et.al 2012), it also indirectly impact intention to use. Ayodele et al. (2016) also proved that usefulness decides attitude and behavioural intentions about using technology. Fornell & Larcker (1981) also checked and supported that Perceived usefulness affects attitude in LMS.

H₁: perceived usefulness positively effects attitude towards use of technology.

A system's assumed ease of use (PEOU) refers to the degree to which a person perceives that it would not be difficult to use a particular technology. According to Chang et.al (2012) PEOU is one of the most important determinants of attitude of towards use of technology. Adwan et al. (2013) have concluded in their study that ease of use is a predictor of perceived use and attitude towards use of technology. Jaber (2016) on investigation of the relationship found that in e learning PEOU not only affect attitude and perceived usefulness but also behavioural intention as

well as actual usage of technology. In 2017 Tarhini et.al (2017) concluded that in online enterpreneuship development programmes PEOu determines attitude, behavioual intention and actual usage of technology. Salloum et al. (2019) has also proved that PEOU has direct positive relationship with attitude and indirectly the behavioural intention to use the technology. Thus this leads to following Hypothesis

> **H₂:** *Perceived ease of use has positive effect on attitude towards technology.*
> **H₃:** *perceived ease of use has positive effect on usefulness.*

Salloum et al. (2019) in a study on university students of e learning concluded that Attitude towards use (ATT) has a positive effect on the behavioral intention to use (BI) the e-learning system and same has been concluded in earlier study by Revythi and Tselios (2017) on students of early childhood education. A study conducted in India by Despande et al. (2012) also said that intention to use technology depends on attitude towards technology

> **H₄:** *Attitude towards technology has positive effect on behavioural intention to use.*

Liao & lu (2008); Mou et al. (2017) had given their verdict in favour that behavioural intention to use technology has a great impact on actual Usage. The same has concluded by other studies done by Salloum et.al (2019) and Gahtani (2016), Adwan et al. (2013). They all have found out significant impact of BI on actual usage of technology.

> **H₅:** *Behavioural intention to use technology has positive effect on actual usage of technology.*

RESEARCH METHODOLOGY

The research method used in the study was survey method and sampling done was non probability convenience sampling. The focus of study was to find out technology adoption by the students of school aged between 12 years to 18 years. The study considered perceived ease of use and perceived usefulness as independent variables which affect attitude towards technology. Attitude affects behavioural intentions and then actual usage of technology by the students.

Data Collection

The data was collected with the help of Google form from the students of various schools of Gwalior (central India) region from June to August 2020. Data from 635 students were collected but 561 responses were utilized for final analysis. The questionnaire consisted of total 22 items , 5 for perceived usefulness, 5 for perceived ease of use, 5 for attitude towards using, 3 for Behavioural intentions and 4 for actual usage. All questions were measured on 7 point likert type scale ranging from 1 to 7, where 1 stood for strongly disagree and 7 stood for strongly agree.

In total 561 responses which were used were 279 were from female students and 282 from male students. There were 168 students were from 12years to 14 years, 232 students were from age group of 14 years to 16 years and rests 161 were from age group of 16 years to 18 years.

Data Analysis

The data were analyzed using two step approach, first CFA (confirmatory Factor Analysis was done to identify or develop measurement model. For analysis of Cause and effect relationship, the proposed model was tested using PLS SEM 3. The CFA was done for construct reliability, validity, while SEM was used to evaluate model fit of proposed model.

CFA

For construct durability, convergent validity and discriminant validity, the model is evaluated. The internal consistency (construct reliability) of the model was validated by checking the alpha and composite reliability of Cronbach. The composite reliability (Henseler et al. 2009) and the alpha of Cronbach are above 0.7 for all variables, as seen in Table 1, and so all frameworks are called consistent. Average Variance Extracted (AVE) should be greater than 0.5 to assess the convergent validity, so that the results showed that the square root of AVE was greater than the correlation coefficients. Smart PLS uses get Fornell et al. (1981) to check discriminant validity. Since the results are found satisfactory and so constructs can be further used to test the structural model Table 2.

Table 1 RESULTS FOR THE ASSESSMENT OF REFLECTIVE MEASUREMENT AND COMPOSITE MODELS				
	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Actual Usage	0.716	0.772	0.816	0.531
Attitude	0.933	0.934	0.949	0.789
Behavioural Intention	0.808	0.816	0.886	0.722
Perceived Usefulness	0.927	0.928	0.945	0.774
Perceived ease of use	0.880	0.892	0.912	0.676

Table 2 DISCRIMINANT VALIDITY ASSESSMENT OF THE CONSTRUCTS MODELED AS COMMON FACTOR (FORNELL-LARCKER CRITERION)					
	Actual Usage	Attitude	Behavioural Intention	Perceived Usefulness	Perceived ease of use
Actual Usage	0.728				
Attitude	0.297	0.888			
Behavioural Intention	0.192	0.376	0.849		
Perceived Usefulness	0.220	0.381	0.458	0.880	
Perceived ease of use	0.298	0.408	0.619	0.463	0.822

Table 3 DISCRIMINANT VALIDITY ASSESSMENT OF THE CONSTRUCTS MODELED AS COMMON FACTORS HETEROTRAIT-MONOTRAIT RATIO (HTMT)					
	Actual Usage	Attitude	Behavioural Intention	Perceived Usefulness	Perceived ease of use
Actual Usage					
Attitude	0.365				
Behavioural Intention	0.224	0.430			
Perceived Usefulness	0.279	0.408	0.522		

Perceived ease of use	0.357	0.445	0.726	0.503	

The Structural Model

Kock & Lynn (2012) suggested the collinearity test to address the issue of Common Method Variance on the model. The Smart PLS-SEM 3 software generates the Variance Inflation Factors (VIFs) for all latent variables in the model. Pathological collinearity is indicated if the VIF is greater than 3.3, indicating common method bias. If the values are below 3.3 Table 3, the model is considered free from bias. The VIF values of the latent variables in our model are below 3.3 and thus the model is free from common method bias.

The next step after determination of variance in the model by independent variables is analysis of path coefficients and the Table 4 is showing all the path coefficients for all the relationship in the variables. As the Table 4 and Figure 1 are showing that all the relationships are significant and result supported the hypotheses.

Table 4
DETERMINATION OF VARIANCE IN THE MODEL BY INDEPENDENT VARIABLES IS ANALYSIS OF PATH COEFFICIENTS

|		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Supported
H1	Perceived Usefulness -> Attitude	0.244	0.245	0.053	4.572	0	Yes
H2	Perceived ease of use -> Attitude	0.295	0.297	0.057	5.166	0	Yes
H3	Perceived ease of use -> Perceived Usefulness	0.463	0.463	0.064	7.275	0	Yes
H4	Attitude -> Behavioural Intention	0.376	0.38	0.056	6.727	0	Yes
H5	Behavioural Intention -> Actual Usage	0.192	0.203	0.041	4.654	0	Yes
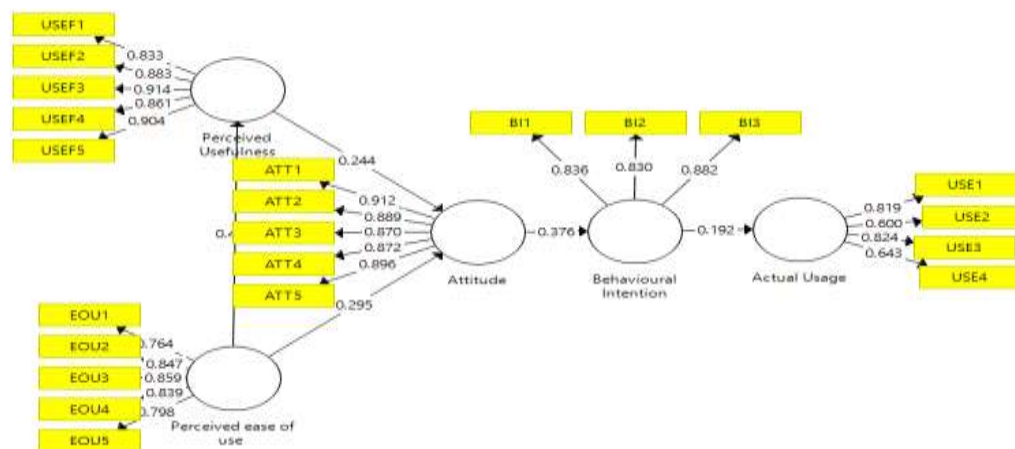
FIGURE 1
PATH MODEL

To maintain the interpretability of all results we have analyzed. The coefficient of determination, R^2, is the proportion of the variance of the dependent variable that is explained by

the independent variables. The above table shows the model explains 34.9% variance in actual usage. To access the model effect size the F^2 value of exogenous variable is checked the f2 standard values are 0.38 for BI, 0.272 for usefulness, 0.08 for ease of use suggesting strong for BI and weak for the other two variables. The next was to check Q^2 value that is construct cross validated redundancy For the predictive relevance the construct cross validated redundancy result were analyzed which is having value of 0.14 for perceived ease of use, 0.165 for attitude, 0.199 for behavioural intention, 0.114 for actual usage Thus, suggesting that the full model has a predictive relevance (Hair et al., 2014). At last to check model fit SRMR value was examined which helps in determining the actual and predicted correlation difference. SRMR value less than 0.08 is a good fit criteria (Hair et.al, 2014) and in this study the value of SRMR is 0.052 indicating good fit.

From all the above values and assessments the path model which has been tested can be considered as a good model.

DISCUSSION

The purpose of the present study was to check the acceptance of technology for learning by the students of schools during this Covid era. As all the teaching and learning is going on through various online medium so the study was relevant to check the acceptability of technology. In this study TAM is supported. Based on the data collected from 561 students the acceptability and actual usage were evaluated. The results of the study show that the perceived ease of use and perceived usefulness of technology are important in determining attitude towards technology. Attitude has influence on behavioural intention to use the technology and intentions determine actual usage of technology. The results are in line with the previous studies done by Ofori (2019); Nair & Das (2012) who concluded that technology acceptance model predict adoption of technology. TAM predicts use of technology by teachers while Nair & Das (2012) talked about students and e learning in their study. Weerasinghe (2017) in their study said that TAM is very useful model in predicting acceptance technology by the user.

Implications

The study gives useful suggestions for policymakers, professionals, developers, and designers in effectively adopting the e-learning systems. First, the school administration needs to establish the appropriate infrastructure of e-learning systems and evaluate the readiness of students for e-learning systems. Second, the decision-makers and managers of can take help from the study to focus on those areas which make learning with help of technology more acceptable and more effective. They will get idea of those factors which will play significant role in technology acceptance by the students, which will help them in decision making. The next is the students can be trained in such a manner that may change perception about ease and usefulness of technology and that will improve the attitude of student and the intentions to use technology. The results of study can be used to design better e learning environment and technology acceptance by the students.

Limitations and Suggestions

The results provide important findings about school students' acceptability of technology but the study is not free from limitations. The first limitation is the study considered students aged from 12 years to 18 years only, the study may include the students of different age groups

also. The comparison also can be done on the basis of demographics to find out any difference in the acceptance of technology. The results cannot be generalized as the data collected from only a limited geographical area of central India. To generalize the result the data should be collected from larger area. The study did not consider the external variables which may have impact on TAM, so other external variables if included may change the findings. The next limitation is the sampling technique, the study used convenience sampling, in which generalization of result is not easy, and the further studies can use other sampling techniques for the purpose of generalization of results. The study was done during covid era, when the mode of learning was only online method, if the study carried on at any other time it would have influenced the results.

CONCLUSION

In the study with the help of standardized questionnaire the technology acceptance model was checked. The reliability and validity of the data was found consistent. The model was found good fit as R^2, F^2 and Q^2 values were found good and SRMR value 0.05 has a good fit. The results suggest that students' opinion regarding ease of use of these methods dominate their mindset towards use in learning. The view about utility is also substantially affected by the sense of ease of use.

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